Engineering Library
OCT 31 1927

PROCEEDINGS

of the

American Society

of

Civil Engineers

TWO PARTS

AMERICAN SOCIETY OF CIVIL ENGINEERS FOUNDED 1852

PART I

NOVEMBER, 1927

CONTENTS

AERIAL TRAMWAYS
By F. C. CARSTARPHEN, M. AM. SOC. C. E.

THE HEAD-WORKS OF THE IMPERIAL CANAL
By C. E. GRUNSKY, PAST-PRESIDENT, AM. SOC. C. E.

BAFFLE-PIER EXPERIMENTS ON MODELS OF PIT RIVER DAMS.
By I. C. STEELE AND R. A. MONROE, MEMBERS, AM. SOC. C. E.

MAXIMUM FLOOD DISCHARGE IN SAN JOAQUIN VALLEY, CALIFORNIA
By OREN REED, JUN. AM. SOC. C. E.

RE-DESIGNING CATAWBA STATION FOR SERVICE ON A LARGE TRANSMISSION SYSTEM
By W. S. LEE, M. AM. SOC. C. E.

THE SCIENCE OF FOUNDATIONS—ITS PRESENT AND FUTURE
By CHARLES TERZAGHI, M. AM. SOC. C. E.

THE CONOWINGO HYDRO-ELECTRIC DEVELOPMENT ON THE SUSQUEHANNA RIVER
By ALEXANDER WILSON, 3D, ESQ.

ANNUAL MEETING, NEW YORK, N. Y.
JANUARY 18-20, 1928

CURRENT PAPERS AND DISCUSSIONS

			Discussion closes
"The Shandaken Tunnel." R. W. GAUSMANN	May,	1927	
Discussion	Nov.,	"	Nov., 192
"The Eye-Bar Cable Suspension Bridge at Florianopolis, Brazil." D. B. STEINMAN and WILLIAM G. GROVE	May,	"	
Discussion	Aug., Sept., Oct., Nov.,	"	Nov., 192
"The Relation of Highway Transportation to the Railway." RALPH BUDD	May,	"	
Discussion	Aug., Oct., Nov.,	"	Nov., 192
"Urban and Interurban Buses." BRITTON I. BUDD	May,	"	
Discussion	Aug.,	"	Nov., 192
The Logging and Lumbering Industries of the Pacific Northwest: A Symposium.	May,	"	
Discussion	Aug.,	"	Nov., 192
"Some Phases of Irrigation Financing." D. C. HENNY	May,	"	
Discussion	Aug., Sept., Oct., Nov.,	"	Nov., 192
"State Reclamation in Washington." R. K. TIFFANY	May,	"	
Discussion	Aug., Sept.,	"	Nov., 192
"Tides and Their Engineering Aspects." G. T. RUDE	Aug.,	"	
Discussion	Oct., Nov.,	"	Jan., 192
"Notes on Arched Gravity Dams." B. F. JAKOBSEN	Aug.,	"	
Discussion	Oct., Nov.,	"	Dec., 192
"Preparing the Ground Work for a City: The Regrading of Seattle, Washington." ARTHUR H. DIMOCK	Aug.,	"	
Discussion	Oct.,	"	Dec., 192
"Re-Arrangement of a Business District: Changes in Recent Years in Pittsburgh, Pennsylvania." NATHAN SCHEIN	Aug.,	"	
Discussion	Oct.,	"	Dec., 192
"The Planning of the Industrial City of Longview, Washington." S. HERBERT HARE	Aug.,	"	
Discussion	Oct.,	"	Dec., 192
"Modern Crushed Stone and Gravel Surfacing." J. W. HOOVER	Aug.,	"	
Discussion	Oct.,	"	Dec., 192
"Relation of Road Type to Tire Wear." O. L. WALLER and H. E. PHELPS	Aug.,	"	
Discussion	Nov.,	"	Dec., 192
"Stream Pollution in the Pacific Northwest." WILLIAM F. ALLISON	Aug.,	"	
Discussion	Oct., Nov.,	"	Dec., 192
"The Sewage Disposal Problem of Los Angeles, California." WILLIS T. KNOWLTON	Aug.,	"	
Discussion	Nov.,	"	Dec., 192
"The Work of the Los Angeles County (California) Sanitation Districts." ALBERT K. WARREN	Aug.,	"	Dec., 192
"The Lake Washington Ship Canal, Washington." W. J. BARDEN and A. W. SARGENT	Aug.,	"	
Discussion	Oct.,	"	Dec., 192
"The Work of the Port of Seattle, Washington." GEORGE F. COTTERILL	Aug.,	"	
Discussion	Oct.,	"	Dec., 192
"Precise Weir Measurements." ERNEST W. SCHODER and the late KENNETH B. TURNER	Sept.,	"	Jan., 192
"Basic Information Needed for a Regional Plan." HAROLD M. LEWIS	Sept.,	"	
Discussion	Nov.,	"	Jan., 192
"Housing and the Regional Plan." JOHN IHLDER	Sept.,	"	
Discussion	Nov.,	"	Jan., 192
"Cultural Opportunities in Regional Planning." ANDREW WRIGHT CRAWFORD	Sept.,	"	
Discussion	Nov.,	"	Jan., 192
"Forecast: The Regional Community of the Future." THOMAS ADAMS	Sept.,	"	
Discussion	Nov.,	"	Jan., 192
"The History and Development of Road Building in the United States." THOMAS H. MACDONALD	Sept.,	"	Jan., 192
"The Question of Roads in France." P. LE GAVRIAN	Sept.,	"	Jan., 192
Historic Review of the Development of Sanitary Engineering in the United States During the Past One Hundred and Fifty Years: A Symposium	Sept.,	"	Jan., 192
Industrial Waste Disposal: A Symposium	Sept.,	"	Jan., 192
"Earth Work by the Hydraulic Method." ROY E. MILLER	Sept.,	"	
Discussion	Nov.,	"	Jan., 192
"Problems in Concrete Dam Construction on the Pacific Coast." ARTHUR S. BENT	Sept.,	"	
Discussion	Nov.,	"	Jan., 192
"New Theory for the Centrifugal Pump." A. F. SHERZER	Oct.,	"	Feb., 192
"The Hydraulic Design of Flume and Siphon Transitions." JULIAN HINDS	Oct.,	"	Feb., 192
"Water-Power Appraisals." WILLIAM H. CUSHMAN	Oct.,	"	Feb., 192
"The Great Yangtze Bar." H. VON HEIDENSTAM	Oct.,	"	Feb., 192
"Side Spillways for Regulating Diversion Canals." W. H. R. NIMMO	Oct.,	"	Feb., 192
"A Graphic Method for Determining the Stresses in Circular Arches Under Normal Loads by the Cain Formulas." FREDERICK HALL FOWLER	Oct.,	"	Feb., 192
"Surveying and Mapping in the United States." C. H. BIRDSEYE	Oct.,	"	Feb., 192
"Surveys on the Coast of New Jersey." VICTOR GELINEAU	Oct.,	"	Feb., 192
"Advances in Waterway Engineering During a Half Century." W. M. BLACK	Oct.,	"	Feb., 192
"The Delaware River from Philadelphia to the Sea." F. C. BOGGS	Oct.,	"	Feb., 192
"Traffic Control by Electric Signal Lights." M. O. ELDRIDGE	Oct.,	"	Feb., 192
"Traffic Control in New York, N. Y." PHILIP D. HOYT	Oct.,	"	Feb., 192
"Snow Removal Methods in New York, N. Y." ELMER G. GOODWIN	Oct.,	"	Feb., 192
"Snow Removal from Streets in Boston, Mass." EDWARD F. MURPHY	Oct.,	"	Feb., 192
"Boundary Surveys." C. T. JOHNSTON	Oct.,	"	Feb., 192

AMERICAN SOCIETY OF CIVIL ENGINEERS

PROCEEDINGS

VOL. LIII NOVEMBER, 1927 No. 9

SOCIETY AFFAIRS

Lincoln Bush Nominated for President

The Official Nominating Committee of the Society met in Columbus, Ohio, on October 8, 1927, and chose Lincoln Bush as the "Official Nominee for President" of the Society. This is the first instance of the new method of nominating Presidents in accordance with the Constitution as amended last March.

Lincoln Bush was born in Illinois, and there received his engineering training. Practically all his professional life has been spent in railway work, first in the West with the Union Pacific and Chicago Northwestern Railways (besides considerable work with the Pittsburgh Bridge Company), and, later, in the East, with the Delaware, Lackawanna, and Western Railroad, of which he became Chief Engineer.

Since 1909 he has been consulting and contracting engineer, largely in connection with bridges and viaducts, foundations, and railroad terminals.

Colonel Bush is especially well-versed in Society affairs, having been a Director from 1912-14; Treasurer, 1915-16; and Vice-President, 1924-26. In addition, he has devoted extensive time to Society work. Following Secretary John H. Dunlap's death, he gave practically all his time to Society affairs for several months. He also did valuable work on the Committee that arranged for the present lease of the 57th Street property so advantageously for the Society.

Aside from these qualifications, Colonel Bush is widely known among members, and extremely popular. Few men have had the opportunity of serving the Society so frequently or so well.

This choice completes the list of official nominees, the remaining candidates being designated in the poll canvassed on October 15, as noted elsewhere in *Proceedings*. The entire list of official nominees for various Society offices for 1928, therefore, comprises the following:

For President, Lincoln Bush.

For Vice-President, Zone I, George W. Fuller.

For Vice-President, Zone IV, Louis C. Hill.

For Directors,

District No. 1, { R. A. Dougherty. / Malcolm Pirnie.

District No. 2, Harrison P. Eddy.

District No. 6, Morris Knowles.

District No. 10, James H. Johnston.

District No. 13, Frederick H. Fowler.

Thomas J. McMinn, 1854-1927.

To a wide list of friends in the Society the death of Thomas J. McMinn on September 21 will come as a distinct shock. For years he has been a stand-by in the activities of the Society. His welcome greeting and cheery face will be missed at the many meetings where his interest in Society affairs led him. Of late years, his activities have been growing less. Perhaps the last meeting he attended was the well remembered Philadelphia Convention where he was present at many sessions and renewed acquaintance with old friends.

When he was retired as Assistant Secretary of the Society in 1919, he had completed more than twenty-one years of

continuous service. The duties of this office were varied, but undoubtedly his major accomplishment was in the field of editing the Society publications. During these years all the technical papers published by the Society passed under his scrutiny.

The *Proceedings* grew during the interval from a relatively small compass to a commanding place among technical publications. He contributed to this growth in the painstaking editing of both small and large technical details, by which the standing of a journal is widely judged. The fact that these publications are well known in this and foreign countries, reflects no mean credit on Mr. McMinn's work. Needless to say he was a fit judge of the niceties of expression. Authors who had occasion to experience the force of his suggestions became aware of his superior grasp of English and his wide knowledge of engineering principles. He left a lasting impression on this part of his work.

Among his associates he was a prime favorite. A certain manner that savored of the old school in its quiet courtesy marked him. He took a great pride in the Society, and the Society had reason to be proud of his accomplishments.

The McMinn tradition still continues in the Society work, not only in the standards that he helped to erect and maintain, but in the person of his son, Stanley P. McMinn, who is capably handling the printing of Part II of *Proceedings*.

Thomas J. McMinn served the Society well and faithfully. In his death it loses a good friend, and many members lose a warm comrade.

DISPENSING TECHNICAL KNOWLEDGE

Recent Society Publications Show Growth

Commencing with the May, 1927, *Proceedings*, four consecutive issues have averaged about 450 pages. By itself this appears as no mean quantity of engineering papers. It compares most favorably with the quantity of material issued by other organizations, both professional and commercial.

Of course, the whole of any one volume is not devoted strictly to technical matter; various Society affairs, records of applications, etc., are included. About 80% of the volumes, however, consists of real engineering information.

This record of material issued also compares to advantage with former years. It was exceeded only once, in 1914. It is true that larger issues of *Proceedings* have been known, but this applies to conditions several years ago, when the monthly volumes included a great deal of material from the minutes of meetings that is not printed in full nowadays. Hence it seems fair to state that unquestionably the amount of technical papers issued within recent months exceeds that for any similar period in Society history.

Such an increase has materially relieved the congestion of papers awaiting publication. While it is true that there is still a considerable interval between the acceptance of papers for publication and their appearance in *Proceedings*, yet that interval is being decreased to the advantage of both the authors and the membership.

CONSTITUTION AMENDED

Requirements for Various Membership Grades Changed

Following is the report of Tellers appointed to canvass the ballot for the proposed Amendment to the Constitution, canvassed October 5, 1927:

"MR. GEORGE T. SEABURY, *Secretary*,
AMERICAN SOCIETY OF CIVIL ENGINEERS:

"DEAR SIR.—The Tellers appointed to canvass the Ballot on Amendment to the Constitution report as follows:

"Total number of ballots received		3 632
"Deduct:		
Ballots from members in arrears of dues	74	
Ballots from members who have died since voting	2	
Ballots not signed	11	
Total ballots not canvassed	87	
Ballots canvassed		3 545
Blank ballots	9	
Void ballots	3	12
"Ballots counted		3 533

"Shall the Proposed Amendment to the Constitution, accompanying circular dated August 17, 1927, be adopted?

Yes	3 207
No	326
"Necessary to adopt	2 356

"Respectfully submitted,
"LEWIS D. RIGHTS, *Chairman*,
E. W. MALONEY,
REUBEN T. ROBINSON,
MALCOLM S. SPELMAN,
ALBERT P. LORIOT,
H. W. KNOX,
A. B. MERRY,
F. R. SCHMID,
GEO. J. GUTEKUNST,
WILLIAM J. BOUCHER,
C. R. HULSART,
H. L. PRESTON,
E. C. GRAFTON,
J. H. ANGEN,
WILLIAM H. CORREALE,
H. T. LARSEN,
T. B. RIGHTS,
"Tellers."

The amendment thus adopted by a large majority relates to the specific requirements for grades of membership in the Society. The net effect of these changes is:

(1) To increase the minimum age for Member from 30 to 32 years and the requisite amount of active practice from 10 to 12 years;

(2) To increase the requisite amount of active practice for the grade of Associate Members from 6 to 8 years; and

(3) To increase the amount of credit to be allowed as active practice for graduation from an engineering or architectural school of recognized standing from 2 to 4 years; to provide credit for attendance at such schools without graduation at the rate of one-half year for each year's attendance satisfactorily completed; and to provide credit for graduation from colleges and universities of recognized standing other than engineering as equivalent to 2 years' active practice.

It will be seen that the increased requirement in terms of length of experience is counterbalanced by the increased allowance given to those who are graduated from engineering or achitectural schools of recognized standing. This added allowance does not apply, however, to courses of allied, but not strictly of engineering, nature. In this latter case the credit is two years only.

This amendment takes effect 30 days from the date of its adoption.

September Society Meeting

The question of "Tides and Their Engineering Aspects" engaged the attention of members at the regular Society meeting on Wednesday, September 7, 1927. This interesting question was well explained by the author of the paper, Gilbert T. Rude, M. Am. Soc. C. E.

Commander Rude dwelt on some of the technical factors entering into the determination of tides; but perhaps more interesting was his treatment of subordinate matters of interest, such as the tide-predicting machine, the vagaries of tidal phenomena, new automatic tide-gauges, and similar recent developments.

A wide and interesting discussion followed his talk. Various points of view were presented by the following members: T. Kennard Thomson, Victor Gelineau, William J. Barden, Charles E. Trout, F. W. Scheidenhelm, H. F. Dunham and J. M. Buckley.

The attendance was 75. Past-President Ridgway presided.

A GREAT STOREHOUSE OF ENGINEERING INFORMATION

A Library Hung High in the Air*

When one leaves the busy street and enters a library, the closing of the door behind him marks his passage into another world. Outside is the world of phenomena and appearances—of thronging pedestrians bustling about their business, of gregarious sights and sounds, of insistent automobiles. Inside, on dusty shelves, is the stored learning of civilized man—the recorded ideas of countless generations.

It is somewhat of a magic world. Here are the theories and secrets for which thousands of men toiled and gave their heart's blood. To produce one book on one phase of an obscure subject may have required the best efforts of a group of men unique in their period. To prove one theory, or establish a single application of a theory, may have taken the devotion of a genius who sacrificed his life to his work. This theory is perhaps stated in one paragraph of unassuming type, and the library contains millions of such paragraphs. However, it is such knowledge, handed down from one generation to another, that raises civilization above the life of savages.

Such a storehouse of knowledge is the Engineering Societies Library. It is a library hung high in the air—higher than

* This item, intended to inform the membership of the work of Engineering Societies Library, is the first of a series. Others will appear in subsequent issues of *Proceedings*.

the hanging gardens of Babylon. One steps from the elevator and through a springed door into a room overlooking the up-town business district of the city. The patrons in evidence at the reading tables are not the types that one sees in the New York Public Library a few blocks away. These latter are merely the same people visible in the street—Tom, Dick, and Mabel. But here, high above them, are men of a professional cast of countenance, selected devotees of science; thoughtful types, many of them with the cautious air that distinguishes an engineer from, say, a Wall Street bond salesman.

On the shelves of this library are 125 000 books. Coming regularly to its tables are 1 200 periodicals. More than half of both classes of accessions are received free, a saving made possible by the publishing departments of the National Engineering Societies with their reviewing and exchanging activities. This notable equipment, although not what it could be with more generous endowment, makes the library one of the greatest engineering collections in the world. Much of this is due to the gifts of $100 000 from James Douglas, mining engineer, and $50 000 from Edward Dean Adams, F. Am. Soc. C. E., financier, whose portraits hang near that of Ambrose Swasey, Hon. M. Am. Soc. C. E., the Cleveland toolmaker, who established the Engineering Foundation. A notable recent gift was that of the valuable Horace Vaughan Winchell collection given by the Anaconda Copper Mining Company.

What first impresses one in entering the Reading-Room is the quiet, intelligent atmosphere. A reader may look around and browse as much as he pleases without interference or question. The staff is notably less officious than, say, that of a public library. The studious calm and the courtesy of the service are in contrast to the atmosphere of many university libraries.

In fact, the quiet and peace tend to hide the immense amount of work that is going on. In addition to the searches of the readers themselves, a staff of two dozen skilled workers is busy in and around the library. Most surprising is the fact that a good proportion of the service is being rendered to clients who never come to the building. Letters, telephone calls, and telegrams are constantly bringing in requests for information—information of diverse and surprising nature. An account of this extra-mural service will be left for a later article. It is too important and too interesting to be disposed of summarily.

Extra Volume of "Transactions"

The mails have just brought to members in good standing, Volume 91 of *Transactions*. To those who are in the habit of studying these yearly issues as they come out, the present volume may appear as a surprise. In fact only a few short months ago (in June), Volume 90 was issued.

Thus, the second sizable *Transactions* presented during the present year comes as a sort of "extra dividend". In common with such more or less unusual events, it should be very welcome. An examination of this latest volume will bear out this happy expectation.

For some years past the attempt has been made to keep volumes of *Transactions* within a reasonable size for convenience in handling. This has been roughly fixed as 1 800 pages maximum. Yearly volumes of this size, however, have not been sufficient to accommodate all the matter requiring publication. The surplus material had been accumulating, so that it became imperative to keep up with the demands or else fall still farther behind.

Together, Volumes 90 and 91 comprise about 2 460 pages, almost evenly divided. Even Volume 82, which comprised material for two years, 1919-20, hardly exceeded this size.

The issuance of this extra volume is a matter alike of great satisfaction and of great relief to those who shared in its many details. It is to be hoped that its usefulness will sufficiently justify the labor and attention required.

HIGHWAY SAFETY COMPETITION

Engineers' Ideas Should Be Valuable

A contest aiming to draw out the best ideas as to highway safety and offering prizes amounting to $1 000, is being conducted by the American Road Builders' Association. This is part of a comprehensive campaign to promote a better understanding of the great problems and importance of highway safety.

Written suggestions in this contest may take the form of an elaborate comprehensive plan or of individual ideas affecting highway safety. The major prizes ($500 and $200) are offered for the comprehensive plan.

It seems self-evident that no class of citizens is better fitted to contribute to this problem than the civil engineers under whom any specific betterment is to be carried out. Hence, members may be interested in this contest. It closes on November 15. Information regarding detailed regulations may be obtained from Charles M. Upham, M. Am. Soc. C. E., Managing Director, American Road Builders' Association, Washington, D. C.

AMERICAN GOOD WILL TOWARD BELGIUM

Dr. Adams Represents Founder Societies at Louvain University

One of the events of the past summer in Europe most significant to engineers was the celebration of 500 years' activity by a notable institution of learning. Louvain University, five centuries old, celebrated an illustrious career on June 28 and 29, 1927. This Society, together with the other Founder Societies and Engineering Foundation, was represented by Edward Dean Adams, F. Am. Soc. C. E.

The exercises themselves were of great interest, but perhaps the one occurrence that appeals most to American engineers consisted of the planting of permanent mementoes by Dr. Adams on the campus of the new Engineering School of the University. In presenting these trees before a large group of notable personages, Dr. Adams said:

"These four little trees of the *Sequoia Gigantea*, popularly known as the Giant California Redwood, have been brought from the mountains of the Pacific Coast across the American Continent to the State of New Jersey, where they were propagated, and have now completed their journey across the Atlantic Ocean, and have been planted in the soil of Louvain. You have seen scattered among the roots Belgian oats, the warmth of whose germination will encourage and stimulate the growth of these little trees.

"Let each of these Sequoias represent one of the four great national engineering societies of America. They are contributed to the five hundredth anniversary of the founding of the University of Louvain, with the expectation that they will prosper in friendly soil and by their natural growth in height, strength, and beauty represent the development of the University during the next five hundred years."

Another opportunity which appealed to Dr. Adams as offering itself to technical men in America was to provide a clock and carillon for the tower in the wonderful new library building for which funds have been supplied by the people of the United States. Space has been provided, but the funds are lacking. The clock and carillon have great significance in the Low Countries. The proposed gift from America would, therefore, be peculiarly acceptable and could be made a memorial to American engineers who died in the war as well as a perpetual token of good will.

Progress in Engineering Standards

The formulation of standards for engineering materials and processes in America is largely under the auspices of the American Engineering Standards Committee. Various engineering societies, including this Society—in fact including most of the important national, as well as governmental and industrial bodies—are co-operating members in this Committee. Its report for the current year lists more than 200 projects under way, of which a considerable number apply to civil engineering and the building trades. A few examples of this work may be cited.

According to the report, more than 100 000 000 railway ties are produced in this country yearly. During the year specifications satisfactory to both the steam and electric railways have been agreed upon for the first time. It is an interesting illustration of the manifold inter-relationships of modern industry that eleven organizations were officially represented on the Sectional Committee through which this unification of specifications has been accomplished. Specifications for tubular steel poles and for girder rails have also been unified and approved.

Code for Building Exits

The code for building exits, which has involved extensive work on the part of a number of organizations over a period of years, has been completed and issued. The revision of the specifications for fire tests of materials and construction, involving some important changes, has been completed and published. The work on spiral steel rods for concrete reinforcement, as submitted by the National Committee on Metals Utilization, was approved. Notable progress has been

made in the work on specifications for cast-iron pipe. The work on rating of rivets has reached the stage in which the Sectional Committee has deemed it desirable to seek formal international co-operation, with a view to bringing about uniformity in the various countries in the world.

Thus, it is seen that the important work being carried forward by the American Engineering Standards Committee has varied aspects and important implications. The Society is rendering real service in promoting its share of this work.

Centrifugal Pump Design

The regular Society Meeting on October 5, 1927, was devoted to a discussion of centrifugal pump design. Allen F. Sherzer, Assoc. M. Am. Soc. C. E,, delivered his paper "New Theory for the Centrifugal Pump".

According to Professor Sherzer present principles using volutes and guide-vanes are incorrect. The design, he says, is a much simpler matter, merely the computation of discharges through three orifices in series—at the entrance to the impeller-vane passages, at the discharge from these passages, and at the throat of the pump. The beauty of this method, aside from its simplicity, appeared in the fact that it seemed more logical and to be fully borne out in practice. Certainly, Professor Sherzer made out a good case for his theory.

Apparently, this is such a specialized subject that few engineers are capable of discussing it offhand. However, Mr. J. W. MacMeeken, of the Worthington Pump and Machinery Corporation, contributed an interesting talk in favor of the current theories of design, giving data in support of his contentions. Professor Sherzer briefly commented on some of these objections.

During the meeting, a report was presented from the Tellers appointed to canvass ballots on the Amendment to the Constitution, covering requirements for membership, indicating that the amendment has received more than the requisite number of affirmative votes necessary for adoption.

Allen Hazen, Vice-President of the Society, presided. The attendance was about 85.

ENGINEERING RESEARCH AND THE ENGINEERING FOUNDATION

Nominalism and Academic Snobbery*

The word, "research", is in danger of becoming an invidious term. At one extreme, it is being cheapened, like the word, "engineer", by use as an artificial stimulant of unworthy causes—a too common abuse nowadays in the exploitation of high sounding words by self-seeking interests. At the other extreme, there is danger of what might be called research snobbery—a pose assumed by pedantic formalists who assert that only their kind of research is "pure". No less an authority than the President of Columbia University has stated that the word "research" is being used to cover a multitude of sins. He referred to members of a university who go through pretentious motions and glean little pepperkernels of insignificant fact in order to make much to-do over trivialities.

Some professors of chemistry or biology throughout the country would deny that there is such a thing as "engineering research". These pure scientists cherish a false pride of caste and an almost religious prejudice against anything associated with what they call "trade". To them, so gross and commercial an application as engineering could never be associated with so sacred a word as "research". Their convictions are so closely wrapped up with self-aggrandizement and what the preacher calls "vanity of vanities", that there is not much hope that they will broaden their views until the sense of the ridiculous overtakes them. Happily, but few scientists continue to harbor such convictions. Co-operation between scientists and engineers has become intimate and mutually helpful.

Engineering research has fairly well crystallized out as a legitimate and meritorious activity. It has passed through its period of adolescence and nose-to-the-grindstone, and is now on a scientific and objective basis. Mercenary considerations have been mellowed by altruism and a professional spirit—much as is medical research, for a concrete analogy. An engineer experimenting scientifically in a research laboratory on the properties of metals is just as truly serving mankind and alleviating its

* This item, intended to inform the membership of the work of Engineering Foundation, is the first of a series. Others will appear in subsequent issues of *Proceedings*.

problems as any bacteriologist in the Rockefeller Institute, and is just as truly disclosing laws of Nature as any professor of chemistry who applies Gibbs' phase rule to an untried combination of elements.

Much engineering research is, of course, done for commercial profit, more or less directly. A corporation such as the General Electric Company cannot afford to engage a Langmuir or a Steinmetz unless there is some indirect advantage in prospect. An increasing number of industrial corporations, however, are taking a long, broad view of what constitutes profit. Still more detached and altruistic is the research work of such an institution as the Engineering Foundation.

This Foundation was the creation of Ambrose Swasey, Hon. M. Am. Soc. C. E., eminent engineer, telescope builder, and machine-tool maker of Cleveland, Ohio, with the aid of friends in the Engineering Societies. Having gained a fortune in engineering, Mr. Swasey determined to benefit his profession in a lasting and idealistic way. Instead of establishing a foundation which would bear his name, but to which contributions of other philanthropists would be unattracted, he devised the happier plan of placing funds in charge of the four Founder Engineering Societies in order to encourage and elevate engineering research of a kind not otherwise likely to be carried on. This generous gift to establish the Engineering Foundation was intended as the beginning of a trust for the country's engineering community—a trust which would grow to great size by additions from other persons interested in, or profiting by, engineering. And who does not profit by engineering?

What has happened since 1914 when the Foundation was established, and what is hoped for the future, will be told in a later article.

Salesmen or Engineers?

A query has been stoutly discussed pro and con for years, and no little uncertainty has been expressed as to "the relation which Sales Engineering in all its phases (*i. e.*, the selling of engineering and construction material or equipment) should properly have in the professional rating of an applicant for membership in the Society, in accordance with the letter and spirit of the Constitution".

To study this question a committee of the Board of Direction was appointed (Messrs. Dennis, Dewell, and Huber), from whose report to the Board at the time of the Denver Convention the following excerpts have been made. According to the Committee the issue may be stated in another way:

"To what extent may the selling of engineering and construction material, together with the furnishing of plans, specifications, and technical advice which may or may not be a part of the service rendered the client or customer, be considered professional engineering service, and to what extent does its successful accomplishment constitute professional engineering experience warranting membership in some grade in the Society? * * * Your Committee finds that Sales Engineering varies from rendering engineering services which require the highest standard of professional training and experience to the plain ordinary *salesmanship* which is in no way different from that employed by the grocer or the dry goods merchant and which does not require engineering training or experience. Obviously persons whose experience falls in the latter class have no place in any grade of membership in the American Society of Civil Engineers.

Sales Engineering

"To properly and fairly judge the experience of an applicant whose experience is in whole, or in part, along the lines of salesmanship is not an easy task. It is further complicated by the skill with which such experience is set forth by the applicant. For example, one applicant may very frankly state the character of his experience, while another, whose experience may have been just as far from actual engineering experience, may submit his record in language which will not so clearly show the facts. Your Committee believes consideration of this subject is timely because it has noted what it believes to be an increasing number of applications by persons whose experience involves so-called Sales Engineering. It is also of the opinion that many of these applications are made solely for any advantage which membership in the Society may afford along lines of salesmanship and *not because of special interest in engineering or in the primary purposes for which the American Society of Civil Engineers exists.*

"The practical suggestion which has come to the Committee for meeting the situation is that a questionnaire be prepared and sent by the Secretary to every applicant whose experience includes salesmanship. It is believed that with the answers to this questionnaire in hand the Board of Direction can correctly and justly rate the applicant's experience, and such engineering experience of a high order which is listed in an applicant's record can then be given full consideration."

The proper solution of this problem should define the dividing line between (1) sales engineers, that is, those who are essentially engineers in the field of sales work, and therefore eligible for membership in some of the technical grades of the Society; and (2) salesmen proper, that is, those who are essentially in the selling business and happen to be interested in the marketing of engineering products—men who have long been considered as properly belonging to the grade of Affiliate.

The issue really amounts to whether a salesman should be classed as an affiliate or as a member. The resolution of this mooted question seems to be imminent.

End-Matching for Soft Wood

All users of lumber are familiar with the ordinary matched boards formed by tongues and grooves in the edges of each strip to provide a secure lock, when the lumber is placed in floors, concrete, forms, etc. End-matching is a similar arrangement whereby the ends of these same boards may be interlocked. For some years hard woods have been so cut and used, but the extension of this to include soft woods is only now being pushed.

Thus, the interlocking of all sides of any one board becomes complete, adding to the strength in shear across the end joints. This likewise means that shorter pieces can be used to advantage with the resulting economy and reduction of waste. This great saving extends from the utilization of a far larger part of the lumber to the greater ease of laying it, because sawing is not required to make the end joints come at proper nailing places.

The question of making the required tongues and grooves in the field is entirely eliminated by simple means. Full strips of the end-matched lumber including short ones are used until the particular course reaches an opening or wall, for example. The piece is then cut and the part left over is used as the starting piece for the next row.

Many advantages for this improvement will appeal to engineers. Not the least of these may be the increase in tightness as well as strength.

The various questions involved have been studied by the National Committee on Wood Utilization, of which Herbert Hoover, Hon. M. Am. Soc. C. E., is Chairman. Under this National Committee, a Sub-Committee on End-Matched Soft Wood Lumber has been operating, on which the engineering viewpoint is presented by R. C. Marshall, Jr., and C. J. Hogue, Members, Am. Soc. C. E.

Advantages

The significant points emphasized by the report of this Committee are summarized as follows:

"In the field of wood utilization it is desirable:

"1. To convert a larger percentage of the American timber harvest into useful commercial products; or, stated conversely, to meet our annual lumber needs by the use of a smaller amount of our standing timber resources.

"2. To improve lumber-manufacturing methods so that the product will show more refinement in assortment and working, which means that a given feetage will produce a greater effect and value in consuming use; and this involves also reducing hand labor on the job by the substitution of cheaper and more accurate machining in preparation, as far as practicable.

"3. To increase transportation efficiency and reduce transportation costs, which form so heavy a percentage of delivered lumber prices, by (*a*) refinement of product to avoid paying freight on a considerable amount of waste and (*b*) refinement of form to secure heavier and more compact lading of cars or cargo space.

"The application of end-matching to those worked building patterns for which it is suitable accomplishes these desired results. End-matching is, undoubtedly, one of the most important developments in the manufacture of worked lumber products that has taken place in the last quarter of a century."

Copies of the full report may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., at a cost of 5 cents a copy.

Report of Tellers on Second Ballot for Official Nominees

"33 West 39th Street, New York, N. Y.,
"October 15, 1927.

"MR. GEORGE T. SEABURY, *Secretary,*
AMERICAN SOCIETY OF CIVIL ENGINEERS.

"DEAR SIR: The Tellers appointed to canvass the Second Ballot for Official Nominees report as follows:

"Total number of ballots received	3 019
"Deduct: Ballots from members in arrears of dues.	37
" not signed	14
"Total ballots not canvassed	51
"Ballots canvassed	2 968

"For Vice-President, Zone I:

George W. Fuller	1 110
Void	0
Blank	59
Total	1 169

"For Directors, District No. 1:
(Two to be elected)

R. E. Dougherty	594
Malcolm Pirnie	590
Void	0
Blank for one Director	52
Blank for two Directors	22
Total	1 258*

"For Director, District No. 2:

Harrison P. Eddy	264
Henry R. Buck	113
Void	10
Blank	0
Total	387

"For Vice-President, Zone IV:

Louis C. Hill	631
J. M. Howe	439
D. C. Henny	282
Void	3
Blank	0
Total	1 355

"For Director, District No. 6:

Morris Knowles	168
Void	3
Blank	0
Total	171

"For Director, District No. 10:

James H. Johnston	189
D. Hewitt Wood	83
Void	1
Blank	0
Total	273

"For Director, District No. 13:

Frederick H. Fowler	299
Void	0
Blank	31
Total	330

"Respectfully submitted,
"ARTHUR H. PRATT, *Chairman,*

"SYDNEY WILMOT, "LEICESTER DURHAM,
H. D. HUSSEY, H. A. FOSTER,
W. A. CUENOT, C. L. SPAULDING,
H. T. LARSEN, B. S. VOORHEES,
"Tellers."

* Number of votes cast for two Directors.

Meeting of Executive Committee

This is an abstract of the notes of the Secretary and subject to approval by the Executive Committee at its next meeting.

The Executive Committee met on September 27, 1927, at 10:00 A. M., at Society Headquarters; President, John F. Stevens in the chair; George T. Seabury, Secretary; and present, also, Messrs. Davison, Hazen, and Hoyt.

Following approval of the minutes of the Committee's meeting on June 13, 1927, as adopted by the Board of Direction, many matters of Society business were considered and acted upon, in advance of the meeting of the Board to be held at the time of the Fall Meeting in Columbus, Ohio.

Local Sections*

Colorado.—September 12, 1927. Following a dinner, Mr. H. C. Boyden, of the Celite Products Company, gave an illustrated talk on the use of diatomaceous earth in concrete. Interesting slides were shown. Progress reports of committees were presented and discussed. Attendance 20.

Duluth.—Mr. J. F. Base gave an account of the Annual Convention at Denver, Colo., which he attended as an official representative of the Section. He spoke particularly of the meeting of Local Section Representatives. Attendance 16.

Northwestern.—The following officers were elected: President, Bernard Blum; Vice-President, J. A. Childs; Second Vice-President, H. D. Lovering; Secretary-Treasurer, F. S. Altman. Colonel H. C. Boyden, of the Celite Products Company, gave an interesting talk on "Workability in Concrete with Particular Reference to the Use of Diatomaceous Silica". Attendance 22.

Sacramento.—September 6, 1927. Mr. A. C. Hardison, Director of the State Agricultural Society and Past-President of the California Farm Bureau Federation, addressed the Section on "The Agricultural Situation in California". Attendance 29.

September 18, 1927. Fifteen members of the Section visited the Lancha Plana Dam site on Mokelumne River, where the East Bay Municipal Utility District is beginning construction of a 365-ft. concrete dam. They also visited the San Andreas Plant of the Calaveras Cement Company, where they were guests of the Company at luncheon.

September 21, 1927. At a joint luncheon with the Sacramento Chapter, American Association of Engineers, and the delegates attending a convention of the League of California Municipalities, Mr. A. J. Wagner, City Engineer of Sacramento, described the construction of the City's new 108-in. precast concrete sewer. He also discussed the operation of the filtration plant and garbage incinerator. The structures were subsequently visited. Attendance 169.

* For list of Local Section Officers, Rules, etc., see 1927 Year Book, p. 104.

September 28, 1927. Mr. Manley W. Sahlberg addressed the Section on "Experiences Gained in Meeting the Public". Attendance 17.

October 4, 1927. Mr. Philip S. Taylor, Manager of the San Andreas Plant of Calaveras Cement Company, addressed the Section on "The Manufacture of Cement". Attendance 35.

St. Louis.—September 26, 1927. A resolution was adopted pertaining to the Fall Meeting of the Society of 1929 or 1930. The new Constitution of the Section was adopted. A general discussion on various subjects was given by Messrs. F. W. Green, J. C. Pritchard, H. Austill, R. J. Lockwood, W. W. Horner, and W. C. E. Becker. A resolution was adopted regarding conditions in the Army Reserve Training Camps. Attendance 19.

Progress Reports of Committees of Technical Divisions

Progress Report of the Committee of the Irrigation Division on Co-Operation Between Federal and State Agencies*

At the Summer Meeting of the Society held in Salt Lake City, Utah, in 1925, the Committee submitted an outline of all activities relating to irrigation carried on by co-operative agencies of Federal and State Government. It was pointed out that irrigation might be divided into five general parts:

1.—System.
2.—Laws.
3.—Land settlement.
4.—Agricultural economics.
5.—Research investigation.

Throughout this list run concurrently the major items of finances and organization. The various Federal Departments that have to deal, directly or indirectly, with irrigation in one or more of the phases given were listed. Briefly, the Federal Departments that co-operate with State agencies in irrigation work of appreciable magnitude include the following:

1.—Department of the Interior: Through the Bureau of Reclamation; the Bureau of Indian Affairs; and the General Land Office.

2.—Department of Agriculture: Through the Division of Agricultural Engineering of the Bureau of Public Roads; The Office of Western Irrigated Agriculture of the Bureau of Plant Industry; and the States Relation Service.

The previous report of the Committee, therefore, gave a brief history of co-operative work and an outline of the laws under which the various activities were carried on.

This progress report will deal with one phase of co-operative irrigation that is of more direct interest to the irrigation engineer. While directly or indirectly he is interested in all the items listed, the Committee feels that he would like to know just what research studies are now being conducted that should yield constructive information toward the proper accomplishment of the other four phases.

Toward the construction and improvement of the "System" as an engineering work there are the projects of the Division of Agricultural Engineering in co-operation with agencies as specified.

Evaporation.—At present, nearly all new systems are dependent on reservoir water, and extensive improvement in the water supply of many of the largest going systems of the country consists in construction of reservoir storage to extend the irrigation season beyond the first summer flow. In a similar way many municipalities have grown to such an extent that their reservoir storage must be increased so as to provide for long-time carry-over (in the neighborhood of San Diego, Calif., some of the reservoirs are based on 4 or 5 years' carry-over). In all these operations the extent of the losses by direct evaporation from the surface of the reservoir is of greatest moment, especially where long-time carry-over is essential. It has been known for

* Presented at the meeting of the Irrigation Division, Denver, Colo., July 14, 1927.

many years that the evaporation as measured by a land pan situated near the reservoir did not truly reflect the loss from the reservoir; the pan loss must be reduced about one-third to secure the reservoir loss. Some years ago R. B. Sleight, Assoc. M. Am. Soc. C. E., working under the direction of Samuel Fortier, M. Am. Soc. C. E., conducted experiments at Denver, Colo., with many types of so called "standard pans" and extended the size of the pans to 12 ft. in diameter.* His curve of relationship seemed to indicate that the evaporation from a 12-ft. land pan approximated that from a large reservoir surface. In order to verify or modify this conclusion, several projects are now under way.

The Division of Agricultural Engineering, co-operating with the Colorado Agricultural Experiment Station at Fort Collins, has installed a watertight copper lining in a concrete reservoir about 85 ft. in diameter. With this relatively large "land pan" and several types of the ordinary "standard pans", supplemented by very complete and sensitive apparatus for the development of all attendant meteorological conditions, it is expected that quite definite coefficients will be made available, extending the Denver work from a maximum sized pan of 12 ft. to one of 85 ft. in diameter. Supplementing this work the same Division, in informal co-operation with the U. S. Bureau of Reclamation and the City of San Diego, is taking readings on land pans, reservoir pans, and actual reservoir surface on reservoirs where all inflow and outflow can be accounted for, leaving a residue that must be the evaporation.

Thus, from these co-operative projects, the Committee expects to secure quite definite coefficients whereby it may convert the great mass of pan-evaporation data now available in the United States to the equivalent reservoir evaporation in the same localities. Its ultimate aim is to develop a map showing lines of equal evaporation applicable to reservoir areas.

A third project on the same general subject deals with an investigation toward the prevention of evaporation by oil film covers, or otherwise.

Seepage Losses from Canals.—The great increase in the value of water during the past few years has developed a real interest in the quantities of water lost by seepage and the relation between the cost of seepage prevention or alleviation and the value of the water saved. A further angle to this problem arises in the fact that the seepage from canals bordered by irrigated lands sometimes ruins the adjoining lands and results in damage claims that more than offset the cost of the seepage prevention. For the last three decades, or more, measurements have been made to determine the loss in certain reaches of various canals. The method usually employed involved measurements of the flow at the two ends of a reach of canal and credit and debit items for water entering or leaving the canals. The losses were usually computed as a percentage of the flow entering the reach or a percentage per mile of canal.

There is now in course of preparation a study on much more elaborate lines. In addition to the basic measurements suggested, the study also includes the permeability of materials used in the construction of conduits;

* "Evaporation from the Surfaces of Water and River-Bed Materials," by R. B. Sleight, *Journal of Agricultural Research*, Vol. X, No. 5, July 30, 1917.

the nature of the material adjacent to canal sections; the height of the ground-water; the size and the shape of the water cross-section; the velocity of the water; the amount and character of the sediment in suspension; the temperatures of the soil, water, and air; etc. In securing these data the effort has been made to secure quantitative results of seepage and obtain a measure of the influence of the respective factors which affect these results; also, to ascertain the cost, durability, and efficiency of existing and proposed expedients and devices for reducing or eliminating seepage losses; also, to determine the economic value attaching to elimination or alleviation of seepage losses.

The work is being carried on by the Division of Agricultural Engineering in co-operation with the Department of Public Works of the State of California and with the Board of Water Engineers of the State of Texas.

Lining as Applied to Irrigation Canals and Ditches.—A study of canal lining follows as a natural corollary to the last mentioned project of canal seepage. Obviously, the principal method of preventing seepage of earthen canals is to install a canal lining of some type. About 1917, the Department of Agriculture published a *Bulletin* (No. 126) dealing with this subject. The object of the present project is to bring up to date the paper mentioned.

The work is being carried on by the Division of Agricultural Engineering in informal co-operation with various irrigation districts and power companies throughout the West.

The Control of Silt in Irrigation Canals and Reservoirs.—The Division of Agricultural Engineering has just prepared the manuscript for a *Bulletin* on the silt in the Colorado River. This paper is of timely interest as pertinent to the contemplated reservoir projects on this stream. The work was a co-operative measure between the Division mentioned, the Department of Public Works of the State of California, the Imperial Irrigation District, and the U. S. Bureaus of Reclamation and of Indian Affairs.

A further study of this question, so vital to the length of the physical life of reservoirs on silt-carrying streams, is being conducted by the Division in co-operation with the Board of Water Engineers of the State of Texas.

The Flow of Water in Canals, Pipes, and Other Conduits.—For several years past, the Division, in informal co-operation with the U. S. Bureau of Reclamation, various irrigation districts, power companies, and municipalities, has conducted studies of carrying capacity. These studies have resulted in three papers: "The Flow of Water in Irrigation Channels" (*Bulletin 194*); "The Flow of Water in Wood Stave Pipe" (*Bulletin 376*); and "The Flow of Water in Concrete Pipe" (*Bulletin 852*). Two more papers of this series are in course of preparation: "The Flow of Water in Riveted Steel and Analogous Pipe", and "The Flow of Water in Flumes". These papers give tables and basic data by which conduits of nearly all the most used materials can be constructed under the guidance of the latest information on the subject.

The Flow of Water through Culverts.—The University of Iowa, in co-operation with the Division, has just published the results of a very extensive

series of tests on the carrying capacity of culverts of various materials and under various conditions of inlet and outlet. While primarily of interest to the road builder, the information is of value to the irrigation engineer in two ways: First, for the conveyance of ditches and canals under roads; and, second, for tube deliveries through canal banks.

In addition to these projects that are of direct interest to the irrigation engineer, there are several that may be considered as part engineering and the remainder from one or more of the phases of agriculture, economics, or law.

Closely related to engineering may be found projects bearing on the Drainage of Irrigated Lands, conducted in the Lower Rio Grande Valley in co-operation with the Agricultural Experiment Station of Texas; the Pumping of Water for Irrigation, in co-operation with the Utah Experiment Station; the Required Capacity of Drains for Irrigated Lands, co-operating informally with the U. S. Bureau of Reclamation, the Division of Soil Technology of the University of California, irrigation and drainage districts, and others; the Effects of Pumping from Wells on Ground-Water Levels, in informal co-operation with the Division of Soil Technology of the University of California; the Relative Elevation of the Water-Table and the Plane of Saturation in Fine Textured Soils, in co-operation with the Utah Agricultural Experiment Station; the Utilization of Early and Late Season Waters, in co-operation with the Utah Experiment Station.

In addition to the close co-operation on these projects, between the Division of Agricultural Engineering and the various State agencies, there is another list of projects, carried on by the State Experiment Stations, and co-operating with the Federal Department of Agriculture, by virtue of certain funds known as the Hatch and Adams Funds. At present, these projects are approved by the Federal Department through the Office of Experiment Stations. The projects may or may not be conducted in co-operation or co-ordination with the Division of Agricultural Engineering of the Bureau of Public Roads.

The last available list of the projects of this nature, for 1926, probably covers current work to a large degree.

Work that may be classed as irrigation engineering, may be summarized in the following list:

1.—The use of measuring devices by Montana and by Arizona.
2.—Relation of stream discharge to precipitation, Utah.
3.—Seepage, in Gallatin Valley, Montana.
4.—Cost of pumping irrigation water, by Montana; irrigation pumping machinery, by Arizona.
5.—Ground-water studies, by Arizona, New Mexico, and Utah.
6.—Cost of rice irrigation, by Arkansas.

Quasi-engineering projects may be listed as follows:

1.—Duty of water, by Montana, Oregon, Arizona, Nevada, New Mexico, and Idaho.
2.—Methods of Applying Water: Border irrigation, by Washington Sub-Station; orchard irrigation, by Montana; best length and

width of borders, by Hermiston Sub-Station in Oregon; conditions governing application of water, by Idaho; comparative irrigation trials, by North Dakota.

3.—Soil moisture studies, by Montana, California, Washington, and North Dakota.

4.—Over-head irrigation, by Illinois and New Jersey.

In looking over these projects, the recommendation most desired at this time is toward co-ordination of work, where direct co-operation is not available. It would appear to be a most desirable condition if organizations scattered over many States, but working on the same major subjects, could work in closer harmony of project outline than appears to be the case at present. The results of long years of effort and the expenditure of large sums of money may not become available to other workers in the same field for reading and suggestion until after publication. In some cases it would be difficult to secure agreement upon an outline, if submitted broadcast before the work is undertaken. However, it appears to the Committee that the net result of closer co-ordination of work along the same lines would disclose pitfalls, prevent some duplication of effort, and tabulate results along similar lines so that comparable figures may be easily deducted from widely scattered publications, etc.

Would it be amiss to state in conclusion:

"It would seem that some technical branch of the Federal Government, such, for instance, as the Division of Agricultural Engineering, is in a position to review proposed irrigation and drainage projects and to co-relate the details of these projects in such a way as to supplement rather than duplicate effort?"

It is further suggested that the Irrigation and Power Divisions of the Society co-operate in further work of this Committee toward a study of the co-operation and co-ordination between Federal and State agencies in matters that pertain to subjects only allied to engineering, such as the necessary permits in Government-owned areas. At present, regulation without co-operation or co-ordination is in effect, largely in connection with hydro-electric power, but much future irrigation construction goes hand in hand in power development. Without the power, the irrigation will not be feasible.

Respectfully submitted,
Committee on Co-Operation Between Federal and State Agencies,
By FRED C. SCOBEY,
Chairman.

July 14, 1927.

Engineering Societies Library

The services of the Engineering Societies Library are available to all members who wish searches, copies, translations, etc., or advice on technical literature. A collection of modern books is also available for loan to members in North America, at moderate rentals. Correspondence should be addressed to the Director, Engineering Societies Library, 29 West 39th Street, New York, N. Y., who will gladly give information concerning the charges for the various kinds of work. A more comprehensive statement in regard to this matter will be found on pages 126 and 127 of the Year Book for 1927.

Book Notices*

(September 1 to September 30, 1927)

Investigations on the Theory of the Brownian Movement. By Albert Einstein. N. Y., E. P. Dutton & Co., [1926]. 124 pp., diagrams, 8 x 5 in., cloth. $1.75.

These five papers appeared in Germany (1905 to 1908), in various scientific journals. They are here collected and published in translation, with notes on later work, by R. Fürth.

See- und Hafenbau. By Franz Franzins and Karl Bökemann. Berlin u. Leipzig, Walter de Gruyter & Co., 1927. 152 pp., illus., 6 x 4 in., cloth. 1,50 r.m.

The little book discusses the sea and its movements, coast forms, the protection of land from encroachment, and the construction of harbors, docks, etc.

Surface History of the Earth. By John Joly. Oxford, Clarendon Press; [N. Y., Oxford Univ. Press, Am. Branch]. 1925. 192 pp., illus., maps, 9 x 6 in., cloth. $3.00.

This clear and comprehensive theory attempts to explain certain great events that are recurrent in the history of the earth's surface, such as the slow advance of the seas upon the continents, the retrogression of the seas, and the rising of the mountain ranges. The hypothesis adopted is based upon radioactivity and isostacy.

Theory and Practice of Rolling of Steel. By Wilhelm Tafel. Translated by Richard Rimbach. Cleveland, Penton Publ. Co., 1927. 300 pp., diagrams, tab., 9 x 6 in., cloth. $6.00.

This work is an introduction to the theory and understanding of steel rolling and roll-pass design. It treats the design of passes and the arrangement of rolls especially for merchant bars and shapes requiring equal and unequal draft which are discussed in detail.

Your Money's Worth. By Stuart Chase and F. J. Schlink. N. Y., Macmillan Co., 1927. 285 pp., 8 x 5 in., cloth. $2.00.

Addressed to the ultimate consumer, this book calls attention to some of the more important methods by which he is led to pay extravagant prices for commodities. Adulteration and deceptive advertising are discussed, also the difficulty of obtaining unbiased information and the waste in selling.

Additions to the Reading Room

Water Channels. By George Higgins, M. Am. Soc. C. E. Lond., Crosby Lockwood and Son, 1927. 135 pp., diagrams, tab., pl., 9 x 11 in., cloth.

This treatise is limited in scope to hydraulic problems in the design of channels for the conveyance of water. The author's aim is to furnish, graphically where possible, such information as will be useful to the designer of a channel, or a system of channels.

* The statements made in these notices are taken from the books themselves, and this Society is not responsible for them. Unless otherwise specified, the books in this list have been donated by publishers.

Current Civil Engineering Literature

Key to Abbreviated References to Publications Indexed*

Abbreviated References.	Publication.	Place.
Am. C. Inst.	*American Concrete Institute, Proceedings* (Y.)	Detroit
A. I. E. E.	*American Institute of Electrical Engineers Journal* (M.)	New York
A. R. E. A.	*American Railway Engineering Association, Proceedings* (Y.)	Chicago
A. S. T. M.	*American Society for Testing Materials, Proceedings* (Y.)	Philadelphia
Am. Soc. C. E.	*American Society of Civil Engineers, Proceedings* (M.)	New York
Am. Soc. Mun. Impvts.	*American Society for Municipal Improvements, Proceedings* (Y.)	New York
Am. W. W. Assoc.	*American Water Works Association, Journal* (M.)	Baltimore
Am. Wood Prs. Assoc.	*American Wood Preservers Association, Proceedings* (Y.)	Chicago
Ann. P. et C.	*Annales des Ponts et Chaussees* (Bi-M.)	Paris
Ann. T. P. Belg.	*Annales des Travaux Publics de Belgique* (Bi-M.)	Brussels
Assoc. Ing. Gand.	*Annales de l'Association des Ingénieurs sortis des Ecoles Spéciales de Gand* (Q.)	Ghent
Bost. Soc. C. E.	*Boston Society of Civil Engineers, Journal* (M.)	Boston
Can. Engr.	*Canadian Engineer* (W.)	Toronto
Cornell C. E.	*Cornell Civil Engineer* (M.)	Ithaca
Dock & Harbour	*Dock and Harbour Authority* (M.)	London
Eng.	*Engineering* (W.)	London
Eng. & Contr.	*Engineering and Contracting* (M.)	Chicago
Eng. Inst. Can.	*Engineering Institute of Canada, Journal* (M.)	Montreal
Eng. N. R.	*Engineering News-Record* (W.)	New York
Engrs. Soc. W. Pa.	*Engineers' Society of Western Pennsylvania, Journal* (M.)	Pittsburgh
Engr.	*Engineer* (W.)	London
Engrs. & Eng.	*Engineers and Engineering, Engineers' Club of Philadelphia* (M.)	Philadelphia
Gas und Wasser	*Gas und Wasserfach* (W.)	München
Gen. Civ.	*Le Génie Civil* (W.)	Paris
Gesund. Ing.	*Gesundheits Ingenieur* (W.)	Munich
Inst. C. E.	*Institution of Civil Engineers Minutes of Proceedings* (Q.)	London
Inst. Mun. & Co. Engrs.	*Institution of Municipal and County Engineers, Journal* (W.)	London
Int. Ry. Cong. Assoc.	*International Railway Congress Association, Bulletin* (M.)	Brussels
Land. Arch.	*Landscape Architecture* (M.)	Boston
Mech. Eng.	*Mechanical Engineering* (M.) *Journal of the American Society of Mechanical Engineers*	New York
Mil. Engr.	*Military Engineer* (Bi-M.)	Washington
Min. & Metal.	*Mining and Metallurgy* (M.) *American Institute of Mining Engineers*	New York
Mun. & Co. Eng.	*Municipal and County Engineering* (M.)	Indianapolis
N. E. W. W. Assoc.	*New England Water Works Association, Journal* (Q.)	Boston
N. Y. R. R. Club.	*New York Railroad Club, Proceedings* (M.)	Brooklyn
Oest. Ing. Arch. Ver.	*Oesterreichischer Ingenieur und Architekten Verein, Zeitschrift* (F.)	Vienna
Power	*Power* (W.)	New York
Rev. Gen.	*Revue Générale des Chemins de Fer* (M.)	Paris
Ry. Age	*Railway Age* (W.)	New York
Ry. Eng. & Main.	*Railway Engineering and Maintenance* (M.)	Chicago
Schw. Bauz.	*Schweizerische Bauzeitung* (W.)	Zurich
Sci. Am.	*Scientific American* (M.)	New York
Soc. Ing. Civ. Fr.	*Société des Ingénieurs Civils de France, Mémoires et Comptes Rendus* (Q.)	Paris
Tech. Gemein.	*Technisches Gemeindeblatt* (F.)	Berlin
Ver. deu. Ing.	*Verein deutscher Ingenieure, Zeitschrift* (W.)	Berlin
West. Constr. N.	*Western Construction News* (F.)	San Francisco
West. Ry. Club.	*Western Railway Club, Proceedings* (M.)	Chicago
West. Soc. Engrs.	*Western Society of Engineers, Journal* (M.)	Chicago
Zeit. Bau.	*Zeitschrift fur Bauwesen* (Q.)	Berlin
Z. d. Bauver.	*Zentralblatt der Bauverwaltung* (W.)	Berlin

* Y = Yearly; Q = Quarterly; M = Monthly; F = Fortnightly; W = Weekly.

A. Applied Sciences

a. Processes of Calculation

3. Stresses and Strains

A Graphical Analysis of Stress.* H. W. Swift. Engr. Aug. 26, '27.

B. Applied Mechanics

a. Mechanics of Solids

1. Mechanical Processes

Knicken eines Stabes unter Temperatur-Spannungen.* (Buckling of a Rod under Thermal Stresses.) Arnold Escher. Schw. Bauz. Aug. 27, '27.

6. Heterogeneous Solids (Reinforced Materials)

Calcul des Cadres Verticaux Multiples dans une Batterie de Cuves Rectangulaires.* (Calculation of Multiple Vertical Frames in a Battery of Rectangular Tanks.) F.-L. Delafontaine. Gen. Civ. Aug. 6, '27.

b. Hydraulics

3. Industrial Hydraulics

Hydro-Electric Turbines in General and for Niagara in Particular.* F. Nagler. West. Soc. Engrs. Aug., '27.

Automatic Starting of Centrifugal Pumps.* C. N. McDavitt. Power Aug. 23, '27.

Recent Progress in Hydro-Dynamics.* G. Darrieus. (Paper read before Soc. Ing. Civils de France.) Serial beginning Aug. 26, '27.

Precise Weir Measurements.* Ernest W. Schoder and Kenneth B. Turner. Am. Soc. C. E. Sept., '27.

Hydro Development at Hemmings Falls.* Can. Engr. Sept. 13, '27.

Large Hydro-Electric Plant at Eguzon, France.* L. B. Desbled. Eng. N. R. Sept. 22, '27.

De la Stabilité des Installations Hydrauliques Munies de Chambres d'Équilibre.* (The Stability of Hydraulic Installations Equipped with Equilibrium Chambers.) Jules Calame and Daniel Gaden. Schw. Bauz. Serial beginning July 30, '27.

Entsandungsanlagen für Wasserkraftwerke.* (Sand-Removing Installations for Water Power Plants.) J. Büchi. Ver. deu. Ing. Aug. 27, '27.

4. Dams

The Cement Factor in Durability of Cement Concrete for Hydraulic Structures. T. P. Dresser. West. Constr. N. Sept. 10, '27.

C. Materials of Construction and General Processes

a. Lime, Cement, Mortar, Concrete, Brick, Bitumin, Timber, etc.

The Effect of Mica on Concrete.* John L. Hemmert. West. Constr. N. Aug. 25, '27.

The Determination of Free-Water Content of Field Aggregates. R. P. V. Marquardsen. Eng. & Contr. (W. W.) Sept., '27.

Mécanisme de l'Action des Eaux de Diverses Natures sur les Mortiers et le Beton Armé. Mesures de Protection à Prendre.* (Mechanism of the Action of Different Kinds of Water on Mortars and Reinforced Concrete. Protective Measure to be Taken.) E. Maynard. Gen. Civ. Aug. 13, '27.

e. Earthwork, Cubage, Excavating Machinery

Earth Work by the Hydraulic Method. Roy E. Miller. Am. Soc. C. E. Sept., '27.

Gleitflächen bei Rutschungen in Ton.* (Slip Surfaces in Slides in Clay). Karl Backofen. Z. d. Bauver. Serial beginning Aug. 3, '27.

f. Rock Excavation, Mining, Rock Removal

Abstracts of Institute Publications. Min. & Metal. Sept., '27.

Winter Excavation and Embankment Construction.* C. S. Hill. Eng. N. R. Sept. 15, '27.

Tiefbohreinrichtungen mit electrischem Antrieb.* (Deep Drilling Devices with Electric Drive.) L. Steiner. Ver. deu. Ing. Aug. 20, '27.

g. Execution of Works, Specifications

Planning and Servicing Winter Construction.* Eng. N. R. Sept., '27.

Dead-Loads of Tier Buildings.* Robins Fleming. Eng. N. R. Sept. 22, '27.

2. Of Concrete

A Novel and Economical Type of Retaining Wall.* R. McC. Beanfield. West. Constr. N. Sept. 10, '27.

4. Of Metal

Details for Wind Connections in Tier Buildings.* Walter H. Weiskopf. Eng. N. R. Sept. 8, '27.

5. Of Reinforced Concrete

Prescriptions Nouvelles pour le Dosage des Betons. Nouveau Batiment en Beton Armé des Tuileries de Beauvais.* (New Regulations for Proportioning Concrete. New Reinforced Concrete Building of the Tuileries de Beauvais.) G. Magnel. Gen. Civ. Aug. 20, '27.

Internationale Vorschriften für Eisenbeton. (International Specifications for Ferro-concrete.) Oest. Ing. Arch. Ver. Aug. 19, '27.

h. Foundations, Bridge Piers, and Abutments

Central Vermont Carries Out Complex Bridge Renewal Work.* Ry. Eng. & Main. Sept., '27.

Design of Ice-Breaker Pier Nose for Missouri River Bridges.* J. E. Kirkham. Eng. N. R. Sept. 1, '27.

Foundation Work Hampered by Soft Ground and Seamy Rock.* C. H. Dickinson. Eng. N. R. Sept. 15, '27.

j. Piles and Pile-Driving

The "Vibro" Concrete Piling System.* C. H. S. Tupholme. Dock & Harbour Sept. 21, '27.

k. Tunnels and Tunneling-Shields

Construction Methods on the Moffat Tunnel. Discussion: Lazarus White. Am. Soc. C. E. Sept., '27.
The Hudson River Vehicular Tunnel.* J. Bernard Walker. Sci. Am. Sept., '27.
Tunneling for City Railway at Sydney, Australia.* Eng. N. R. Sept. 8, '27.

l. Construction Machinery and Tools, Drainage

Winter Construction Methods and Plant.* C. S. Hill. Eng. N. R. Sept. 8, '27.

x. Miscellaneous

Die allgemeine Bedeutung der Werkstoffprüfung.* (The General Importance of the Testing of Materials.) Wilhelm Schmidt. Ver. deu. Ing. Aug. 6, '27.

D. Highways

a. Location

Mid-Glamorgan Inter-Valley Roads Scheme. G. A. Phillips. Inst. Mun. & Co. Engrs. Sept. 6, '27.
Die Lage Deutschlands im europäischen Strassennets. (The Position of Germany in the European Highway System.) W. Arntz. Z. d. Bauver. July 13, '27.

c. Construction

New Developments in Concrete Pavement Construction.* J. E. Jellick. West. Constr. N. Aug. 25, '27.
The History and Development of Road Building in the United States. Thomas H. MacDonald. Am. Soc. C. E. Sept., '27.
Station Work—Day Labor Road Building.* C. M. Hathaway. Eng. N. R. Sept. 15, '27.
Concrete Road Construction in Winter.* C. S. Hill. Eng. N. R. Sept. 22, '27.
Rational Design of Bonding Steel in Concrete Roads.* Edward E. Bauer. Eng. N. R. Sept. 22, '27.
Kalksandsteine als Strassenbaustoff.* (Calcareous Sandstones as Road Building Material.) Georg Wegner. Tech. Gemein. Aug. 5, '27.
Ueber die Verwendungsfähigkeit nord- und mitteldeutscher Granite im Strassenbau. (On the Adaptability of North and Central German Granites in Road Building.) J. Brix. Tech. Gemein. Serial beginning Aug. 5, '27.
Der Nürburgring, die neue Deutsche Gebirgs-Rennund Prüfungsstrasse im Rheinland.* (The Nürburg Track, the New German Mountains, Racing, and Test Road in the Rhineland.) Ladislaus Jonasz. Oest. Ing. Arch. Ver. Aug. 5, '27.
Der Nürburgring.* (The Nürburg Track.) L. Jonasz. Ver. deu. Ing. Aug. 6, '27.

d. Maintenance

What Causes Corrugations in Traffic-Bound Roads? J. P. McMakin. Eng. N. R. Sept., '27.
Federal Influence and Authority: Highway Maintenance. Thomas H. MacDonald. Eng. N. R. Sept. 1, '27.
Roads: Some General Observations on Maintenance and Improvement. M. B. McBeth. Inst. Mun. & Co. Engrs. Sept. 6, '27.

h. Vehicles, Automobiles, Traffic

Lighted Arterial Stop Signs, As Recently Installed in Fresno, California.* Andrew M. Jensen. West. Constr. N. Aug. 25, '27.
The Question of Roads in France.* P. Legavrian. Am. Soc. C. E. Sept., '27.
Automobile Hazard in Cities and Its Reduction. Discussion: W. W. Crosby, Theodore T. McCrosky, and R. S. Kirby. Am. Soc. C. E. Sept., '27.

E. Bridges, Viaducts and Arches

b. Iron and Steel Bridges and Viaducts

Missouri River Highway Bridges in North Dakota.* Clifford Johnson. Eng. N. R. Sept. 15, '27.
Wabash Ry. Builds New Bridge Over Sangamon River.* S. M. Smith. Eng. N. R. Sept. 22, '27.

d. Concrete and Reinforced Concrete Bridges and Viaducts

The Calculation of Reinforced Concrete Bridges Consisting of Three Sections on Four Piers.* Fernand Berger and Paul Van Weyenberghe. Int. Ry. Cong. Assoc. Aug., '27.
Repairing Concrete Arch Ribs in Klamath River Bridge.* Eng. N. R. Sept. 1, '27.
Bridge Construction at Niagara Falls.* G. D. O'Connor. Can. Engr. Sept. 6, '27.
Bogenbrücken aus umschnürtem Beton nach System Ljungberg.* (Arch Bridges of Hoop-Reinforced Concrete, According to the Ljungberg System.) Eger. Z. de. Bauver. Aug. 24, '27.

f. Suspension Bridges. Transfer Bridges

The Eye-Bar Cable Suspension Bridge at Florianoplis, Brazil. Discussion: V. R. Covell and T. J. Wilkerson, and A D. Nutter, Esq. Am. Soc. C. E. Sept., '27.

Le Développement des Ponts Suspendus Rigides et les Grands Ponts Suspendus en Amérique.* (Development of Rigid Suspension Bridges and Large Suspension Bridges in America.) (Paper read before Société des Ingenieurs Civils de France.) G. Leinekugel le Cocq. Gen. Civ. Aug. 6, '27.

Le nouveau Pont de la Caille près de Cruseilles (Haute-Savoie).* (The New Caille Bridge near Cruseilles, Haute-Savoie.) F. Chavaz. Schw. Bauz. Aug. 27, '27.

g. Swing, Bascule, Lift, Floating, Oscillating Bridges, Traveling Cranes

Montage du Pont Basculant pour Route sur le Canal de Gand à Terneuzen, à Selzaete.* (Erection of the Highway Bascule Bridge Over the Canal from Ghent to Terneuzen, at Selzaete.) J. Hache. Ann. T. P. Belg. Aug., '27.

x. Miscellaneous

Die Gestaltung der Brücken. Ein Beitrag zur Entwicklung der deutschen Brückenbaukunst.* (Bridge Architecture. A Contribution on the Development of the German Bridge Building Art.) K. Schaechterle. Ver. deu. Ing. Aug. 27, '27.

F. Inland Waters

c. Regulation of Waterways—Volume of Discharge, Freshets, Floods, Soundings

The Control of the Levels of the Great Lakes. G. B. Pillsbury. West. Soc. Engrs. Aug., '27.

Probability of Flood Flows. Discussion: R. W. Davenport, R. D. Goodrich, and Allen Hazen. Am. Soc. C. E. Sept., '27.

Rainfall and Run-off.* E. G. Marriott. Eng. Irst. Can. Sept., '27.

Flood Fight on the Lower Mississippi.* W. H. Holcombe. Mil. Engr. Sept.–Oct., '27.

Die Einwirkung des Hochwasserüberschwemmungsgebiets auf den Abflussvorgang eines Flusses.* (The Influence of the Flood Area on the Flow of a River.) Kahle. Z. d. Bauver. Aug. 10, '27.

d. Diverting Dams, Locks, Lifts, Elevators, Inclined Planes

The Nag Hammadi Barrage. Engr. Sept. 2, '27.

Zur Geschichte der Entstehung stromaufgerichteter Buhnen am Niederrhein.* (On the History of Origin of the Groins on the Lower Rhine Pointing Up-Stream.) L. Bräuler. Z. d. Bauver. Aug. 17, '27.

j. River and Lake Ports, Equipment

N. Y. Canal Terminals Designed for Rapid Cargo Handling.* Maurice W. Williams. Eng. N. R. Sept. 15, '27.

G. Maritime Works

a. Behaviour of Movements of the Ocean, Winds, Waves, Tides, Currents

A New Tidal Theory and Supporting Data.* Edward Godfrey. Eng. & Contr. (W. W.) Sept., '27.

c. Vessels and Maritime Navigation, Lighthouses, Buoys, Various Signals

Application des Moteurs à Combustion aux Bateaux de Pêche.* (Application of Combustion Engines to Fishing Boats.) Georges Lumet. Soc. Ing. Civ. Fr. Pt. 3, '27.

Hochseefährschiff "Schwerin" der Deutschen Reichsbahngesellschaft für die Linie Warnemünde-Gjedser, erbaut von F. Schichau, Elbing.* (The Sea-Going Vessel "Schwerin" of the German Railway Union for the Warnemünde-Gjedser Line, Built by F. Schichau, Elbing. Höfinghoff and Stuhr. Ver. deu. Ing. July 30, '27.

d. Roads and Outer Harbors. Dikes and Jetties. Breakwaters

Ein neues Hauptschöpfwerk von 16 cbm Sekundenleistung im Gebiet des Danziger Deichverbandes.* (A New Main Pumping Installation with a Capacity of 16 Cubic Meters per Second, in the Territory of the Danzig Dike-Union.) Bertram. Z. d. Bauver. Aug. 17, '27.

e. Navigation Locks

Le Nouvelle Écluse Maritime d'Ymuiden.* (The New Ymuiden Sea Lock.) S. Blockmans and others. Ann. T. P. Belg. Aug., '27.

g. Dredges and Dredging. Force Pumps. Refloating and Removing Wrecks. Ice-Breakers

Stability of Dredged Cuts in Alluvium. Herbert Chatley. (Read before Jun. Inst. Engrs.) Dock & Harbour Sept., '27.

Dredge Culebra on San Francisco Bar.* F. C. Scheffauer. Mil. Engr. Sept.–Oct., '27.

h. Wharves, Mooring Buoys, Harbor Equipment

Vancouver, B. C.—Canada's Western Grain Port.* H. W. Frith. Dock & Harbour Sept., '27.

Dublin Deepwater Quay.* Dock & Harbour Sept., '27.

The World's Largest Dock System.* Dock & Harbour Serial beginning Sept., '27.

Cape Town Port Elevator.* Dock & Harbour Sept., '27.

l. Harbors

The Port of Preston.* James Barron. Dock & Harbour Sept., '27.

The Port of Paris.* Roy S. MacElwee. Dock & Harbour Sept., '27.

Preussische Hafenbauten bei Harburg-Wilhelmsburg.* (Prussian Harbor Works at Harburg-Wilhelmsburg.) Lohmeyer. Z. d. Bauver. Aug. 24, '27.

H. Railroads. Street and Interurban Railways. Automobiles. Aeronautics

a. Railroads

1. General Articles

What the Flood Did to the Railways.* Ry. Age Sept. 17, '27.

3. Roadbed (Grading Construction Work)

Is a Ballast Toe Line Worth While.* Ry. Eng. & Main. Sept., '27.

4. Track

Breaking of Rails in Service Due to Transverse Fissures Silvery Oval Mark.) Int. Ry. Cong. Assoc. Aug., '27.

The Reading Adopts a New Rail Section.* J. C. Wrenshall. Ry. Eng. & Main. Sept., '27.

Reading Tests New Rail Section.* J. C. Wrenshall. Ry. Age Sept. 10, '27.

Freight Train Curve Resistance.* Edward C. Schmidt. (From *Bulletin 167*, issued by Univ. of Ill.) Ry. Age Sept. 10, '27.

Railway Track-Recording Car Uses Gyroscope.* (From Committee Report Am. Ry. Eng. Assoc.) Eng. N. R. Sept. 15, '27.

Type de Tablier sous Voies Ferrees en Rails hors Service Enrobes de Beton.* (Type of Floor-Slab under Railway Tracks, Made of Discarded Rails Embedded in Concrete.) F. Chaudy. Gen. Civ. July 30, '27.

6. Rolling Stock

The Importance of Accelerating Freight Train Movement.* B. H. Mann. (Paper read before Am. Assoc. of R. R. Supts.) Ry. Age Aug. 27, '27.

Ten 2-8-8-2 Type Locomotives for the D. & R. G. W.* Ry. Age Sept. 3, '27.

La Nouvelle Locomotive du Loetschberg (Type 1AAA-AAA1). * (The New Loetschberg Locomotive (Type 1AAA-AAA1.)) G. L. Meyfarth. Rev. Gen. Aug., '27.

Les Dispositifs de Freinage a Puissance Variable.* (The Arrangements for Braking with Variable Power.) L. Chamon. Gen. Civ. Aug. 13, '27.

7. Use of Electricity

L'Electrification des Chemins de Fer du Midi. Etat Actuel des Lignes et du Materiel.* (Electrification of the Midi Railways. Present Status of the Lines and Material.) Gen. Civ. Serial beginning July 30, '27.

8. Stations, Terminals, Engine Houses, Shops

The Organization of a Stores Department. H. Marsh. (From *Railway Gazette.*) Int. Ry. Cong. Assoc. Aug., '27.

Erie Builds Tool Houses of Concrete.* Ry. Eng. & Main. Sept., '27.

Southern Builds New Passenger Station at Greensboro, N. C.* Ry. Age Sept. 3, '27.

Transformation de la Gare des Voyageurs de Limoges-Bénédictins.* (Enlarging the Limoges-Bénédictins Station.) Quantin. Rev. Gen. Aug., '27.

Massenfertigung von Holzersatzteilen in Eisenbahnwerken.* (Mass Production of Wood Spare Parts in Railway Shops.) Bardtke. Ver. deu. Ing. Aug. 6, '27.

c. Ferry Boats

Die neue Landbrücke für die Fähre über den Mersey gegenüber Liverpool.* (The New Landing Bridge for the Ferry Over the Mersey to Liverpool.) Eger. Z. d. Bauver. July 27, '27.

f. Aeronautics

1. General Articles

Les Routes Aériennes Transatlantiques Possibles pour un Service Commercial.* (Aerial Transatlantic Routes Possible for Commercial Service.) C. R. Monney. Gen. Civ. July 30, '27.

Das Flugzeug im Dienst des fachtechnischen Unterrichts.* (The Airplane in the Service of Technical Education.) Ewald. Z. d. Bauver. Aug. 10, '27.

4. Aerodromes and Landing Fields

Les Hangars d'Avions du Palyvestre, près de Toulon.* (The Palyvestre Airplane Hangars near Toulon.) Ch. Dantin. Gen. Civ. Aug. 27, '27.

I. Municipal Water-Works. Agricultural Engineering. Irrigation

a. General Articles

The Impounding Works of the San Diego Water System.* R. C. Wueste. Am. W. W. Assoc. Sept., '27.

Neuerungen im Wasserwerksbetrieb. (Improvements in Water Works Operation.) Vollmar. Gas und Wasser. Serial beginning July 16, '27.

b. Hydrology, Water Resources

New 20-In. Well at Benson, Minn.* Theo. K. Lee. Eng. & Contr. Sept., '27.

Well Water Recessions in Iowa.* James H. Lees. Am. W. W. Assoc. Sept., '27.

Developing a 6-M. G. D. Water Supply for Oil Field Operations.* Eng. N. R. Sept. 1, '27.

A Problem of Municipal Water Supply in the Oil Fields.* F. M. Veatch. Eng. N. R. Sept. 8, '27.

The Au Deep-Well Current Meter for Locating Leaks.* Albert G. Fiedler. Eng. N. R. Sept. 8, '27.

Developing Ground Water Supplies. W. G. Kirchoffer. (From *Water Works Engineering.*) Can. Engr. Sept. 13, '27.

Der derzeitige Stand der Wünschelrutenfrage. (The Present Status of the Divining Rod Question.) Hasse. Tech. Gemein. Aug. 20, '27.

c. Dams and Reservoirs

Steel Standpipes for Water Supply of Seattle.* J. H. Quense. West. Constr. N. Aug. 25, '27.
Stony Gorge Dam.* West. Constr. N. Aug. 25, '27.
Some Valuable Precautions in the Design and Construction of Dams.* Culbert W. Faries. West. Constr. N. Aug. 25, '27.
Problems in Concrete Dam Construction on the Pacific Coast. Arthur S. Bent. Am. Soc. C. E. Sept., '27.
The Analysis of Circular Arch Dams by Cain's Method, Including Shear.* C. E. Pearce. West. Constr. N. Sept. 10, '27.
Ausführung von Beton- und Eisenbetonarbeiten beim Bau des Karabentdammes in Turkestan 1924/26.* (Execution of Concrete and Ferro-Concrete Work in the Construction of the Karabent Dam in Turkestan, 1924-1926.) Saller. Z. d. Bauver. July 27, '27.
Der Plan einer Trinkwassertalsperre im Kernwassergrund bei Schwarzwald in Thüringer Wald. Schubert. Gas und Wasser. July 30, '27.

d. Analysis and Purification of Water

Important Points in Field Sanitation.* Ernest W. Steel. Mil Engr. Sept.–Oct., '27.
Filter Plants of Low Cost Construction and Operation. J. H. Fuertes. (Paper read before Texas W. W. Short School.) Eng. & Contr. Sept., '27.
Operation and Control of Rapid Sand Filters. S. T. Powell. (Paper read before Maryland Water & Sewage Plant Operators.) Eng. & Contr. Sept., '27.
How to Protect Drinking Water from Pollution. Ry. Eng. & Main. Sept., '27.
Manufacture of Ferric Aluminum by the Argentine Sanitary Works and Water Supply.* Mario L. Negri and Atilio A. Bado. Am. W. W. Assoc. Sept., '27.
Flow of Water Through Porous Concrete.* W. G. Kichoffer. Eng. & Contr. (W. W.) Sept., '27.
Brilliant Green Bile for the Detection of the Colon-Aerogenes Group.* Am. W. W. Assoc. Sept., '27.
Aerobic Spore-Forming Bacilli Which Ferment Lactose. Stewart A. Koser and Winifred C. Shinn. Am. W. W. Assoc. Sept., '27.
New Filter Plant Construction Methods. J. L. Porter. (Paper read before Southwest W. W. Assoc.) Can. Engr. Sept. 6, '27.
Effluent Aerators Control Mechanical Filters.* Malcolm Pirnie. Eng. N. R. Sept. 8, '27.
Ueber aggressive Kohlensäure und die Mittel zu ihrer Entfernung.* (On Excessive Carbonic Acid in Water, and the Means for Its Removal.) Guido Heinze. Tech. Gemein. Aug. 5, 27.
Trennapparat für Frischwasser-Hauskläranlagen.* (Separatory Apparatus for Fresh Water Domestic Clarification Plants.) J. Braun. Gesund. Ing. Aug. 20, '27.

e. Distribution of Water

Repairing Old Water-Supply Conduit.* Philip O. Macqueen. Mil. Engr. Sept.–Oct., '27.
Some Phases of Irrigation Financing. Discussion: F. H. Newell and J. C. Stevens. Am. Soc. C. E. Sept., '27.
State Reclamation in Washington. F. H. Newell. Am. Soc. C. E. Sept., '27.
Records of the Performance of Small Meters.* W. E. MacDonald. Am. W. W. Assoc. Sept., '27.
The Apulian Aqueduct.* Eng. Sept. 2, '27.

J. Sewerage. Sewage and Refuse Disposal

a. Sewers and Drains

Repairing Concrete Sewer, Regina, Sask.* J. E. Schaeffer. Can. Engr. Aug. 30, '27.
Sulphur Compound Used to Point Tile Liners in Sewer.* Eng. N. R. Sept. 1, '27.
Sacramento Constructing Combined Sewer.* Philip Schuyler. West. Constr. N. Sept. 10, '27.

b. Sewage Disposal, Purification

Important Points in Field Sanitation.* Ernest W. Steel. Mil. Engr. Sept.–Oct., '27.
Historic Review of the Development of Sanitary Engineering in the United States During the Past One Hundred and Fifty Years.* A Symposium. Harrison P. Eddy, George W. Fuller, Samuel A. Greeley, S. H. McCrory, J. A. LePrince, George Truman Palmer. Am. Soc. C. E. Sept., '27.
The New Sewage Treatment Plant of Trenton, N. J. P. N. Daniels. (From paper read before N. J. Sewage Works Assoc.) Eng. & Contr. (W. W.) Sept., '27.
The Prevention of River Pollution. Frank A. B. Preston. (From *The Surveyor.*) Eng. & Contr. (W. W.) Sept., '27.
Ground Water Infiltration in Sewers. D. C. Newman Collins. (Paper read before N. J. Sewage Works Assoc.) Eng. & Contr. (W. W.) Sept., '27.
Industrial Waste Disposal.* A Symposium. W. L. Stevenson, Robert Spurr Weston, Andrew B. Crichton, G. K. Spence, Wilhelm Howalt. Am. Soc. C. E. Sept., '27.
The Sanitary Sewerage System of Chula Vista, California.* Chester A. Smith. West. Constr. N. Sept. 10, '27.
Operation of Sewage-Works of Pontiac, Mich.* James R. Pollock. Eng. N. R. Sept. 15, '27.

c. Refuse Disposal

Die Verwertung des Mülls. (The Utilization of Dust.) Fritz Schrader. Tech. Gemein. Aug. 20, '27.

K. Heat Engines

a. Steam Engines, Boilers

Steam-Turbine Development.* Walter B. Spellmire. Engrs.' Soc. W. Pa. May, '27.

c. Gas and Oil Engines

Solving the Peak Load Problem.* Can. Engr. Aug. 30, '27.
The High-Speed Oil Engine.* H. F. Shepherd. Mech. Eng. Sept., '27.
Les Récents Progrès dans la Construction et l'Application des Moteurs à Huile Lourde.* (Recent Advances in the Construction and Application of Heavy-Oil Engines.) Marcel Bochet. Soc. Ing. Civ. Fr. Pt. 3, '27.
Les Moteurs Diesel de Faible Puissance. (Low Power Diesel Engines.) Richard Perisse. Soc. Ing. Civ. Fr. Pt. 3, '27.

L. Electricity

a. Production of Electricity

2. Magneto and Dynamo. Electric Machines

Modellversuche an Kühlwasserkanälen für Kraftwerke.* (Model Experiments on Cooling Water Channels for Power Plants.) Ver. dcu. Ing. Aug. 20, '27.

b. Distribution and Transmission of Electricity

2. Long-Distance Transmission of Energy

The Vallee Distribution Substation in Montreal.* H. Milliken. Eng. Inst. Can. Sept., '27.
Nouvelle Méthode pour la Recherche des Défauts dans les Câbles à Haute Tension.* (New Method of Searching for Defects in High Tension Cables.) Planer. Gen. Civ. Aug. 20, '27.

4. Measure, Meters, Rate-Making

Pressure, Current and Energy As Elements of the Cost of Power.* A. Dawes DuBos. West. Soc. Engrs. Aug., '27.

f. Signals and Communication

La Détermination des Longitudes par Télégraphie sans Fil.* (The Determination of Longitudes by Wireless Telegraphy.) Guy Malgorn. Gen. Civ. Serial beginning Aug. 27, '27.

M. Architecture

a. Educational, Government and Scientific Buildings

Zum Problem der Akustik im Grossen Versammlungs-Saak des Völkerbund-Gebäudes in Genf.* (On the Problem of Acoustics in the Large Hall of the League of Nations Building in Geneva.) F. M. Osswald. Schw. Bauz. July 30, '27.
Wettbewerb für das Völkerbundsgebäude, Genf.* (Competition for the League of Nations Building, Geneva.) Peter Meyer. Z. d. Bauver. Serial beginning Aug. 3, '27.
Zum Ergebnis des Wettbewerbs für das Völkerbund-Gebäude in Genf.* (On the Result of the Competition for the League of Nations Building in Geneva.) Schw. Bauz. Serial beginning Aug. 13, '27.

g. Other Buildings

Die Theater-Ausstellung in Magdeburg.* (The Theatre Exposition in Magdeburg.) Rühl. Z. d. Bauver. July 27, '27.

i. Fire Protection

The Structural Design of Buildings as Influenced by Stresses Due to Earthquakes and the Relation of Earthquake Insurance. Walter L. Huber. (Paper read before Northern Calif. Mortgage Bankers Assoc.) West. Constr. N. Aug. 25, '27.
Feuerlöschwasserversorgung mit besonderer Betrachtung: Ueberflur- oder Unterflurhydrant.* (Water Supply for Fire Extinguishing with Special Consideration: Above-Floor or Under-Floor Hydrant.) Orthloph. Gesund. Ing. Aug. 13, '27.

O. Administration. Legislation. Economics. Statistics

b. Economic Questions of a General Character, Valuations, Etc.

City Engineering in Washington.* J. Franklin Bell. Mil. Engr. Sept.–Oct., '27.
Industrial Leadership and The Executive. Sam. A. Lewisohn. Mil Engr. Sept.–Oct., '27.
The Scientific Method in Industry. G. Percy Cole. Eng. Inst. Can. Sept., '27.
Revaluation of Denver Buildings for Tax Assessment.* W. L. Prouty. Eng. N. R. Sept. 8, '27.

P. Geology

Die Eötvös'sche Schwerewage und ihre Eignung für die praktische Geologie.* (The Eötvös Torsion Balance and Its Suitability for Practical Geology.) F. Hopfner. Oest. Ing. Arch. Ver. Aug. 19, '27.

Q. Surveying and Geodesy

Bilby Tower for Government Surveys.* Adrienne Ervin. Mil. Engr. Sept.–Oct., '27.
Aerial Maps Find New Applications.* Leon T. Eliel. Mil. Engr. Sept.–Oct., '27.

S. City Planning

The City of the Future.* Ernest Flagg. Sci. Am. Sept., '27.
Cultural Opportunities in Regional Planning. Andrew Wright Crawford. Am. Soc. C. E. Sept., '27.
Forecast: The Regional Community of the Future. Thomas Adams. Am. Soc. C. E. Sept., '27.
Housing and the Regional Plan. John Ihlder. Am. Soc. C. E. Sept., '27.
Basic Information Needed for a Regional Plan.* Harold M. Lewis. Am. Soc. C. E. Sept., '27.
Städtebau in Flensburg.* (City Planning in Flensburg.) Delius. Z. d. Bauver. July 13, '27.
Ideen-Wettbewerb für die Ausgestaltung des linken Mainufers an der Dreikonigskirche in Frankfurt.* (Idea-Competition for the Development of the Left Shore of the Main at the Dreikönigskirche in Frankfurt.) Walther Genzmer. Z. d. Bauver. Aug. 10, '27.

T. Oil and Oil Engineering

Lightning Protection for Oil Storage Tanks and Reservoirs.* Royal W. Sorensen and Others. A. I. E. E. Sept., '27.
Developing a 6-M. G. D. Water Supply for Oil Field Operations.* Eng. N. R. Sept. 1, '27.
A Problem of Municipal Water Supply in the Oil Fields.* F. M. Veatch. Eng. N. R. Sept 8, '27.
Oil Production Engineering in California.* N. A. Bowers. Eng. N. R. Sept. 15, '27.

Employment Service

The Engineering Societies Employment Service is under the joint management of the National Societies of Civil, Mining, Mechanical, and Electrical Engineers. A Chicago office is maintained in co-operation with the Western Society of Engineers, and a San Francisco office, in co-operation with the Engineers' Club of San Francisco and the California Section of the American Chemical Society. The Service is available only to the several memberships and is maintained by contributions from the Societies and their individual members who are directly benefited.

Offices.—Eastern Office, 31 West 39th Street, New York, N. Y., Walter V. Brown, Manager; Chicago Office, 53 West Jackson Boulevard, Room 1736, Chicago, Ill., A. Krauser, Manager; and San Francisco Office, 57 Post Street, Room 715, San Francisco, Calif., Newton D. Cook, Manager.

Men Available.—Under this heading, brief announcements will be published without charge. These announcements will not be repeated, except on request received after an interval of one month. Names and records will remain in the active files of the Service for a period of three months, and are renewable on request. Notices for *Proceedings* should be addressed to Employment Service, 31 West 39th Street, New York, N. Y., and should be received prior to the first of the month.

Opportunities.—A Bulletin of engineering positions available is published weekly and may be obtained by members of the Societies concerned at a subscription rate of $3 per quarter, or $10 per annum, payable in advance. Positions which are not filled promptly as a result of publication in the Bulletin, may be announced herein.

Voluntary Contributions.—Members obtaining positions through the medium of this Service are invited to co-operate with the Societies in the financing of the work by nominal contributions made within thirty days after placement, on the basis of 1½% of yearly salary; temporary positions (of one month or less), 3% of total salary received. The income contributed by the members, together with the finances appropriated by the four Societies named, will be sufficient, it is hoped, not only to maintain but to increase and extend the Service.

Replies to Announcements.—Replies to announcements published herein, or in the Bulletin, should be addressed to the key number indicated in each case, with a two-cent stamp attached for re-forwarding, and forwarded to the Employment Service at the address given. Replies received by the Service after the positions to which they refer have been filled, will not be forwarded.

MEN AVAILABLE

CONSULTING ENGINEER, Assoc. M. Am. Soc. C. E.; age 61; married. Expert on design and construction, dams, masonry of all kinds, aqueducts, pipe lines; hydro-electric, domestic supply, irrigation, hydraulics generally; examinations, estimates, bids, appraisals, reports. Foreign experience, Peru, Mexico, Santo Domingo, Sicily, and Greece. A–2848.

CIVIL ENGINEER, Assoc. M. Am. Soc. C. E. Twelve years' experience, drafting, designing, estimating, and other office work, and eleven years, field engineering. Experience covers topographic and land surveys, railroad location, construction and maintenance, highway engineering, drainage, irrigation, sewerage, and water supply. A–5125.

CIVIL ENGINEER, Assoc. M. Am. Soc. C. E.; age 44; married; field work, construction, or teaching. Three university degrees; 18 years' experience. Best of references. Long job desired, anywhere in United States, except New York City. B–285.

CONSTRUCTION SUPERINTENDENT, Jun. Am. Soc. C. E.; age 30; married; graduate civil engineer; experienced in taking full charge of important building construction projects; forceful executive; intimate knowledge of costs and details of all trades. Available October 15. Location, Metropolitan District. B–4938.

CIVIL ENGINEER, Assoc. M. Am. Soc. C. E.; college graduate; 26 years' experience; ten years, concrete construction; railroads, ten years, location and construction; Chicago traction, four years, track rehabilitation, tunnel reconstruction; hydro-electric, four years, dam developments; valuation, two years, railroads, public utilities; private practice, three years, land surveying, city additions; municipal, three years, water, sewers, street pavements. B-5228.

POST GRADUATE CIVIL ENGINEER, M. Am. Soc. C. E.; age 35. Varied experience: Fifteen years of railroad work, draftsman, maintenance, preliminary location, surveys, plans, estimates, construction work; general practice, industrial, municipal projects; surveys, reinforced concrete design, construction bridges, dams; highway, plans, surveys, location, construction reinforced concrete pavements. B–5307.

CIVIL ENGINEER, M. Am. Soc. C. E. Four years' experience in municipal engineering; two years in mill construction; twelve years in heavy railroad work; and fifteen years in private practice and general contracting. Familiar with all classes of railroad construction, water supply, sewerage, and industrial work. B–5882.

ENGINEER-DRAFTSMAN; age 47; married. Civil engineer, first-class draftsman, citizen; seventeen years, European, and six years, American experience, in railroad design, estimates, and railroad construction, maps, and in sub-divisional calculations and plotting, wants position with railroad or surveyor's office. Location, preferred, New York, or Northeastern States. B–6250.

ASSISTANT OR RESIDENT ENGINEER, Assoc. M. Am. Soc. C. E.; Graduate Civil Engineer, 1910; age 41; married. Recent course in reinforced concrete design; twelve years survey and construction experience, principally railroads—bridges and buildings, track work, wharves and docks. In responsible charge of layout and construction during past six years. Location preferred, East Coast. B–7307.

EXECUTIVE ENGINEER, Assoc. M. Am. Soc. C. E.; age 36; single; graduate engineer. Thirteen years' executive and practical experience, manufacturing and construction, also production and industrial surveys with sales promotion write-ups. Now successfully employed, but desires broader opportunity with added responsibilities. Location preferred, Chicago or East. C–457.

CIVIL ENGINEER, Jun. Am. Soc. C. E.; graduate, University of Cincinnati, with C. E. degree; age 30; married. Eight years' varied experience in railroad maintenance, lock and dam construction, and highways. Location, anywhere. C–2650.

RECENT GRADUATE, Jun. Am. Soc. C. E.; age 24; single. One year's experience in municipal water-works; instrumentman, chief of party, road construction, office and field, investigations. Location immaterial. C-2971.

CIVIL ENGINEER, four years' experience on steel and reinforced concrete (graduate student), desires connection with large university as instructor with chance for research or assistance for higher degree. C–3075.

YOUNG GRADUATE CIVIL ENGINEER AND BRIDGE SUPERINTENDENT, Jun. Am. Soc. C. E., with three years responsible charge of bridge construction and layout. Three months' experience as a structural draftsman. Desires to locate with an engineering organization. Location, immaterial. Best of references. C–3531.

ASSISTANT ENGINEER, Graduate, M. I. T., A. B. and M. S. degrees; age 30; single. Four years' experience in design and checking hydraulic, concrete and steel structures, water supply, water power and power-house fields. Location preferred, New York City, but will go anywhere. C–3594.

Membership

(From September 7 to October 4, 1927)

Additions

		Date of Membership.
ALEXANDER, Ralph Kimball. Field Engr., Truscon Steel Co., Box 1366, Wichita Falls, Tex.	Jun.	Oct. 15, 1923
	Assoc. M.	Aug. 29, 1927
ALEXANDROFF, John Gabriel. Petrorskie linii, 2 pod'jesd 8, Moscow, Union of the Socialistic Soviet Republics.	M.	Aug. 29, 1927
ALSIN, William McKinley. With The Atlas Lumnite Cement Co. (Res., 732 Eighteenth St., Apartment 308), Des Moines, Iowa.	Assoc. M.	Aug. 29, 1927
BARNARD, Russell Edwin. Chf. Engr., R. Hardesty Mfg. Co., Denver, Colo.	Assoc. M.	Aug. 29, 1927
BIRKENWALD, Emil S. Asst. Engr., Southern Ry. (Res., 625 Hawthorne Lane, Apartment 9), Charlotte, N. C.	Jun.	Feb. 25, 1924
	Assoc. M.	Aug. 29, 1927
BRADEN, Allen Leslie. Sanitation Engr. and Insp., Los Angeles County, 12 East 53d St., North Long Beach, Calif.	Jun.	Aug. 29, 1927
BURKETT, Carl Cobb. Asst. Dist. Engr., State Highway Dept., Russellville, Ark.	Assoc. M.	Aug. 29, 1927
BURR, George Danforth. Asst. Engr., Bureau of Eng., Div. of Design, 368 City Hall, San Francisco, Calif.	Jun.	Dec. 14, 1925
	Assoc. M.	Aug. 29, 1927
CHANEY, Ralph Clarke. Engr. in Chg., Eng. Dept., City of Columbus; Engr., The Planning Comm. (Res., 52 Fallis Rd.), Columbus, Ohio.	M.	Aug. 29, 1927
CLARK, Samuel Cushman. Structural Steel Detailer, Post & McCord, 101 Park Ave., New York (Res., 55 Hanson Pl., Brooklyn), N. Y.	Jun.	Aug. 29, 1927
CONKLING, Frank Ellsworth, Jr. Chf. Civ. Engr., Atlantic Fruit Co., Cayo Mambi, Oriente, Cuba.	Jun.	Jan. 14, 1924
	Assoc. M.	Aug. 29, 1927
CORNELL, Arthur Leland, Jr. 203 Lytton Court, West Palm Beach, Fla.	Jun.	Aug. 29, 1927
DARRE-JENSSEN, Lauritz. 514 West 110th St., New York, N. Y.	Jun.	June 6, 1927
DÁVILA, Jorge Victor. Care, Mass. Inst. Tech., Cambridge, Mass.	Jun.	Jan. 14, 1924
	Assoc. M.	Aug. 29, 1927
EEFTING, Theodore. Vice-Pres. and Office Engr., Carr & McFadden, Inc., 209½ South Olive Ave., West Palm Beach, Fla.	Jun.	Aug. 29, 1927
FAISANT, Joseph Leon. Engr. with Van Rensselaer P. Saxe, 41 Knickerbocker Bldg., Baltimore, Md.	Jun.	Mar. 14, 1927
FISHER, Robert John. Insp., Portland Cement Assoc., 425 East Water St., Milwaukee, Wis.	Jun.	July 11, 1927
GOODENOUGH, Bertram Willis. Asst. Engr., East Bay Municipal Utility Dist., 1514 California St., Berkeley, Calif.	Assoc. M.	Aug. 29, 1927
GOODWIN, Clarence Bernard. City Mgr. (Res., 98 South 13th St.), San José, Calif.	M.	Aug. 29, 1927
GREENHALGH, Sidney Franklin. Asst. Engr., New York State Bridge & Tunnel Comm. and New Jersey Interstate Bridge & Tunnel Comm., Woolworth Bldg., New York, N. Y. (Res. 145 Maple Ave., Rahway, N. J)	Jun.	June 1, 1920
	Assoc. M.	Aug. 29, 1927
GUMENSKY, Dmitry Benjamen. 3030 Jackson St., San Francisco, Calif.	Jun.	April 18, 1927
HAY, Marion. Director of Building (Res., 1221 Wilson Drive), Dayton, Ohio.	Assoc. M.	Aug. 29, 1927
HAYES, Henry Howe. Draftsman, Stone & Webster, Inc., 147 Milk St., Boston (Res., 15 John St., Brookline), Mass.	Jun.	Mar. 14, 1927
HAYES, Nathaniel Perkinson. Engr., Carolina Steel & Iron Co. (Res., 402 West Washington St.), Greensboro, N. C.	Jun.	Aug. 29, 1927
HELLER, John Charles. Structural Engr., 507 North Linwood Ave., Baltimore, Md.	Assoc. M.	Aug. 29, 1927
HEUER, Robert Burke. Civ. Engr., Grade III, with County Surv., Los Angeles County, 5454 Seventh Ave., Los Angeles, Calif.	Jun.	Aug. 29, 1927
HORNE, Robert Lee. Asst. Engr., Bureau of Bridges, Dept. of Public Works, Allegheny Co. (Res., 98 Evans Ave.), Pittsburgh, Pa.	Assoc. M.	June 6, 1927
HUDSON, Franklin, Jr. Secy-Treas., Benham Eng. Co., 512 Gumbel Bldg. (Res., 3741 Bell St.), Kansas City, Mo.	Jun.	Oct. 2, 1922
	Assoc. M.	Aug. 29, 1927
JOHNSON, Frank Minitree. U. S. Superv. of Surveys, Gen. Land Office, Interior Dept., 439 Federal Bldg., Denver, Colo.	M.	Aug. 29, 1927
JOHNSTON, William Rowland. Supt. of Constr., U. S. Veterans Hospital, 518 East 3d St., Tucson, Ariz.	M.	Aug. 29, 1927
KAMINSKY, Constantin Denis. Designer, N. Y. C. R. R., 466 Lexington Ave., Room 812, New York, N. Y.	Assoc. M.	Aug. 29, 1927
KAZAN, James. Junior Engr., U. S. Engr. Office, 401 Custom House, San Francisco, Calif.	Jun.	April 18, 1927

MEMBERS—(*Continued*)

		Date of Membership.
KERNOT, Charles Home. Constr. Engr., State Electricity Comm., 22 William St., Melbourne, Victoria, Australia	M.	June 6, 1927
KINSEY, Milton Mansfield. Asst. Engr., C. E. Smith & Co., 2073 Railway Exchange Bldg., St. Louis, Mo	Assoc. M.	Aug. 29, 1927
KORN, Martin Pinney. Cons. Engr., 50 West 86th St., New York, N. Y.	M.	Aug. 29, 1927
KRUGER, Herman August. Constr. Supt., Southern California Edison Co., Los Angeles, Calif	M.	Aug. 29, 1927
KRUYS, Frederik. 328 McKay St., Apartment 1, Montreal, Que., Canada	Jun. Assoc. M.	Mar. 16, 1925 Aug. 29, 1927
LARRY, Herbert Freeman. Asst. Div. Engr., Dept. of Public Works, Allegheny County, 3219 Latonia Ave., Dormont, Pittsburgh, Pa	Jun.	July 11, 1927
McGREW, Jonathan Thomas. Asst. Engr., Moffat Tunnel Comm., West Portal, Colo	Assoc. M.	Aug. 29, 1927
MAU, Carl Frederick. County Surv., Shasta County, 716 Tehama St., Redding, Calif	Assoc. M.	Aug. 29, 1927
MORANTI, Paul Joseph. Pres., Moranti & Raymond, Inc., 253 West 13th St. (Res., 124 West 72d St.), New York, N. Y.	Affiliate	Aug. 29, 1927
NEIGHBOUR, Arthur Grandin. Draftsman, C. R. R. of N. J., 426 Mt. View Terrace, Dunellen, N. J.	Jun.	Aug. 29, 1927
NELSON, Charles Jalmar. Res. Engr., Brown & Cook, Box 363, Keokuk, Iowa	Assoc. M.	Aug. 29, 1927
NIELSEN, Knud Sigurd Buhl. Designer, C. C. C. & St. L. R. R. (Res., L. B. Harrison Club Hotel, Room 242), Cincinnati, Ohio.	Jun.	July 11, 1927
OAKLEY, Thomas Benjamin. Borough Engr., Borough of Richmond, New York (Res., 20 Beach Ave., New Dorp), N. Y.	M.	July 11, 1927
O'CONNELL, Thomas Sarafield. Dist. Engr., State Highway Dept. (Res., 844 North 9th Ave.), Phœnix, Ariz	Assoc. M.	July 11, 1927
O'REILLY, Thomas Charles. Surv., City of Long Beach, 633 Pacific Ave., Long Beach, Calif	Jun.	Aug. 29, 1927
PARKHILL, Gordon Wight. Box 217, Merkel, Tex	Jun.	Oct. 1, 1926
PERRY, Albert Curtis. With Voorhees, Gmelin & Walker, 101 Park Ave., New York, N. Y. (Res., Sound Beach, Conn.)	M.	Aug. 29, 1927
PETTY, Dabney Elijah. Chf. Geologist, Petty Geophysical Eng. Co., Inc., 718 Travis Bldg. (Res., 10 Tenth St.), San Antonio, Tex	Assoc. M.	Aug. 29, 1927
PHILLIPS, Elmer Leroy. Prin. Asst. Engr., San. Sewer Div., City Engr.'s Office, Los Angeles (Res., 361 West Acacia St., Glendale), Calif	Assoc. M.	April 18, 1927
PIRKNER, Herbert Rudolf. Asst. Engr., New York State Bridge & Tunnel Comm. and New Jersey Interstate Bridge & Tunnel Comm., Woolworth Bldg., New York (Res., 7321 Fourth Ave., Brooklyn), N. Y.	Jun. Assoc. M.	May 28, 1923 Aug. 29, 1927
ROWE, Raphael Robinson. Asst. Engr., The Southlands Corporation, 4267 Witherby St., San Diego, Calif	Assoc. M.	Aug. 29, 1927
SAGER, George Henry, Jr. Box 41, Monroe, La	Assoc. M.	Aug. 29, 1927
SCHUSTER, Karl Rudolph. Cons. Engr., 45 John St., New York, N. Y.	M.	April 18, 1927
SCOTT, James Chadwick. Engr., Underpinning & Foundation Co., Inc., 342 Madison Ave., New York, N. Y. (Res., 406 Queen Anne Rd., Teaneck, N. J.)	M.	Aug. 29, 1927
SHAPIRO, David. 456 Hope St., Fall River, Mass	Jun.	Mar. 14, 1927
SHUEY, George Russell. 1084 South Virginia St., Reno, Nev.	Assoc. M.	Aug. 29, 1927
SIPFLE, William Reginald. Care, U. S. Bureau of Public Roads, Fairfax, Wash.	Jun.	Mar. 14, 1927
STAPLETON, Felix. Lawrence Boulevard at Wright Ave., Bayside, N. Y.	Assoc. M.	Mar. 14, 1927
STEVENS, George. 1714 Colby Ave., Everett, Wash	Jun.	April 18, 1927
STEVENSON, James Anne. Box 12, Clemson College, S. C.	Jun.	April 18, 1927
THOMAS, Roderic Bruce. Office Engr., Myers & Noyes, 1107 Mercantile Bank Bldg., Dallas, Tex	Jun. Assoc. M.	Dec. 15, 1924 June 6, 1926
TIER, Fred Hagesmeyer. Draftsman, Gen. Eng. & Management Corporation, 175 Orient Ave., Jersey City, N. J.	Jun.	Aug. 29, 1927
VON BUEHREN, William Frederick. With Henry R. Kent & Co., Rutherford (Res., 234 Paterson Ave., Hasbrouck Heights), N. J.	Assoc. M.	Aug. 29, 1927
WATKINS, James Stephen. First Asst. State Highway Engr., Dept. of State Roads and Highways (Res., 112 Washington St.), Frankfort, Ky	Assoc. M.	Aug. 29, 1927
WEATHERLOW, Hugh Edgar. Office Mgr. of Constr., Raymond Concrete Pile Co., 140 Cedar St., New York, N. Y.	M.	Aug. 29, 1927
WILLIAMS, Charles Augustus, Jr. Gen. Supt., Lustbader Constr. Co., New York (Res., 11 Westcote Rd., Scarsdale), N. Y.	Assoc. M.	Mar. 14, 1927
ZEITZ, Arthur Hampton. Chf. Draftsman, Water Dept. (Res., 5119 Wyandotte St.), Kansas City, Mo	Assoc. M.	Aug. 29, 1927

Reinstatements

Members	Date of Reinstatement
KAST, Clarke Nightingale	Sept. 27, 1927
WRENTMORE, Clarence George	Sept. 27, 1927
Associate Members	
LINEBERGER, Walter Franklin	Sept. 27, 1927

Resignations

Associate Members	Date of Resignation
HOFFMAN, Eugene Robert	Sept. 27, 1927
LAYTE, Ralph Richmond	Sept. 27, 1927
Juniors	
WELLS, Clifton Kennady, Jr	Sept. 27, 1927

Deaths

CARROLL, Mott Titus. Elected Junior, January 17, 1927; died August 5, 1927.
FORSYTH, Robert. Elected Member, May 12, 1875; died September 11, 1927.
KEITH, George Thomas. Elected Member, May 4, 1881; died September 4, 1927.
McMILLAN, Charles. Elected Member, January 29, 1868; died September 19, 1927.
McMINN, Thomas James. Elected Member, March 5, 1890; died September 21, 1927.
RUST, Charles Henry. Elected Member, April 5, 1899; died September 22, 1927.
SHERIDAN, Howard Augustus. Elected Junior, October 12, 1925; died August 2, 1927.
SLAYTON, Charles Albert. Elected Associate Member, April 2, 1902; died September 15, 1927.
SPENCER, John Clark. Elected Associate Member, May 6, 1896; Member, December 6, 1904; died July 6, 1927.
TAYLOR, Charles Frederick. Elected Associate Member, September 4, 1895; Member, April 4, 1905; died August 14, 1927.
WIGHT, Frank Clinton. Elected Member, April 3, 1922; died September 18, 1927.

Total Membership of the Society, October 4, 1927

Members	**5 327**	
Associate Members	**5 602**	
Corporate Members		**10 929**
Honorary Members		**14**
Juniors		**1 307**
Affiliates		**142**
Fellows		**8**
Total		**12 400**